



First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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EDITORIAL COMMENT.

Aircraft in War. As the weeks go by, evidence is steadily accumulating as to the great service which the new arm of the naval and military services

—that of aircraft—is rendering in the awful task in hand across the Channel. Field-Marshal Sir John French, in each of the first two despatches he sent to the War Office, paid such unstinted praise to the work of our flying officers that it would not have been very surprising had he not specifically referred to aircraft in his latest despatch, which, although dated November 20th, was not made public until Monday last.

Yet, Sir John French, who cannot be regarded as one addicted to bestowing praise where it is not merited, has been so impressed with the increasing success of the new arm that he has deemed it desirable to once again mention the work of our military flying officers, which he does in the following terms:—

"The work performed by the Royal Flying Corps has continued to prove of the utmost value to the success of the operations.

"I do not consider it advisable in this despatch to go into any detail as regards the duties assigned to the corps and the nature of their work, but almost every day new

methods for employing them, both strategically and tactically, are discovered and put into practice.

"The development of their use and employment has indeed been quite extraordinary, and I feel sure that no effort should be spared to increase their numbers and perfect their equipment and efficiency."

The foregoing extract from the official despatch is one that is well worthy the closest consideration, for it is noteworthy not so much for what it actually says but rather for what it implies. Although the Royal Flying Corps work has not perhaps come before the public gaze so much as the Royal Naval Air Service by reason of the magnificent flights of some of the officers of the latter into the enemy's country, yet those behind the scenes in the world of aviation are well aware that the untiring work the military flying officers have been engaged in is of a much wider variety than was at first contemplated or even regarded as within the range of possibility. The fact that they and their machines should have proved themselves equal to the new calls made upon them to such an extent as to win the encomiums of so experienced a soldier as the Field-Marshal is one that more than justifies all we have urged in the past as to the vital necessity of a huge air fleet, and must be a further incentive (if such were needed) to those responsible at home for the continued speeding up of the programme of the Admiralty and War Office in the future. Indeed, Sir John's remark that "no effort should be spared to increase their numbers and perfect their equipment and efficiency" may be regarded as indicating that such extension will not be long delayed. In other words, it will result in an immediate impetus to, followed by the permanent establishment upon a solid basis of, the aircraft industry in this country. If assurance were necessary of the power of Great Britain to rise to an emergency, surely no greater lesson exists than the manner in which she has under the present conflict placed herself at the head of the world in the "mastery of air"—always excepting the much-vaunted Zeppelin fleet. But this is another story, for the moral of which we must "wait and see"!

Bombs on Non-Combatants. The news transmitted from Washington by Reuter towards the end of last week, that President Wilson had communicated unofficially to the diplomatic representatives of the United States in the belligerent countries in Europe his disapproval of attacks by bombs dropped from aircraft on unfortified cities occupied by non-

combatants, raises a question of considerable importance. It is understood that Dr. Wilson has discussed the subject of aerial bombs at a secret conference with representatives of the belligerents. It is also said that the President carefully avoided any specific reference, and that all the diplomatic representatives were approached on equal basis.

So far as Great Britain is concerned, we feel that the majority of people will be heartily in accord with the President's view, and that every possible endeavour should be made to ensure that the destructive work of aeroplanes and airships is not centred on places that are unfortified or on non-combatants residing therein. So long, however, as the settlement of international disputes can only be achieved by recourse to warfare, and so long as the peace of the world is threatened by folk permeated with the dangerous doctrine that Might is Right, so long will it be necessary for each of the nations embroiled to use every means in their power to ensure success and victory to their side.

Field-Marshal Sir John French, in the despatch already referred to, mentions that almost every day new methods of employing aircraft are being discovered and put into practice. We may, however, be sure that such methods are of an entirely legitimate military character. For the purpose of destroying forts, the enemy's guns and airships, whether in their factories or otherwise, the encumbering of railway lines and roads to prevent the advance of his troops, the blowing up of convoys of ammunition or supplies, disabling batteries of artillery, indeed for any purpose that will tend to harass the enemy, aircraft may legitimately be used. To employ it, however, for the wanton destruction of historic buildings or other structures in a city, and for the killing of innocent people, is not a purpose that would be expected of any but a nation wedded to the art of "Kultur."

• • •

The Proposed "Industrial" Army Badge. The article we published last week on this subject, in which the suggestion was made that the Admiralty and War Office should undertake the issue of an official "industrial" army badge, has attracted considerable notice. Indeed, we have received numerous letters in commendation of the idea we advanced that the vast army of able-bodied workers all over the country should be furnished with some visible sign that they could wear in their buttonholes or caps to indicate that, although they have not joined the colours, they are none the less fulfilling a very important part for their King and country.

It should be obvious that, without a full complement of efficient workmen to keep our factories and workshops going for the production of much-needed materials and supplies for our naval and military authorities, the work of the latter at the other end of the line would quickly come to a standstill, thereby enabling the enemy without opposition to make his way to our doors. That this is recognised by those in authority is indicated by the letter from Lord Kitchener which we quoted last week, while, since then, in his reassuring speech in the House of Commons on the position of our Navy, the point was once again brought well home by Mr. Churchill when he stated that "the Admiralty had been aided by the energy and determination of the workmen, who had strained their strength to the utmost and who had by so doing made themselves the comrades of their fellow-citizens who were fighting in the trenches."

Newspaper Claptrap.

As we have said, it should be obvious to all thinking persons that it is impossible for every available man to take up arms—that thousands must be retained at home to keep our dockyards, arsenals and other works running. While the public generally may be pardoned for not having at the outset realised this, there is no excuse amongst prominent and brainy newspaper writers who, seeking to act as leaders under the present unprecedented conditions, are proving rather to be misleaders than otherwise of public opinion and thought.

As a case in point, we may refer to Robert Blatchford's article in last Sunday's *Weekly Dispatch*, in which he blatantly insists there should be the following amendment to Mr. Wedgwood's recent question in Parliament:—

"Is there any reason why every adult male in the United Kingdom should not at once join the Territorial Army and commence his training for home defence or foreign service?"

Thereby suggesting his own opinion to be that *every adult male* should join the Territorial Army. While appreciating much that Mr. Blatchford has in the past written in regard to the machinations of the Kaiser and of the war, we cannot but regard his latest outpourings as the veriest claptrap, to discover the hollowness of which requires but the merest modicum of perspicacity.

Indeed it is astounding that so able a controversialist should have allowed himself to be driven to such a length. It is hardly complimentary to the intellects of the readers of the *Weekly Dispatch*.

• • •

"Up Lights, and Drat 'Em." Ever since the Metropolitan Police Order "Up Lights, and Drat 'Em." was issued reducing the lighting of the public streets of London "Dagonet" in the *Referee* has been "up against" the authorities, and in his inimitable style continues to return to the charge. Thus, in his latest criticism of our darkened streets, he considers that "Up Lights, and Drat 'Em" should be London's answer "to a turnip-headed bogey of the bomb from above." He has even suggested that "we should start rehearsing for the Daylight Saving Bill, and so to some extent minimise the terrible loss which is being caused to London by this dreadful blacking-out business." While "Dagonet" can be light and flippant in his touch, he can also be serious, and there is much truth in his remark that "if London is to be blacked out through the whole of the winter months the loss to trades and enterprises will amount to many millions of pounds."

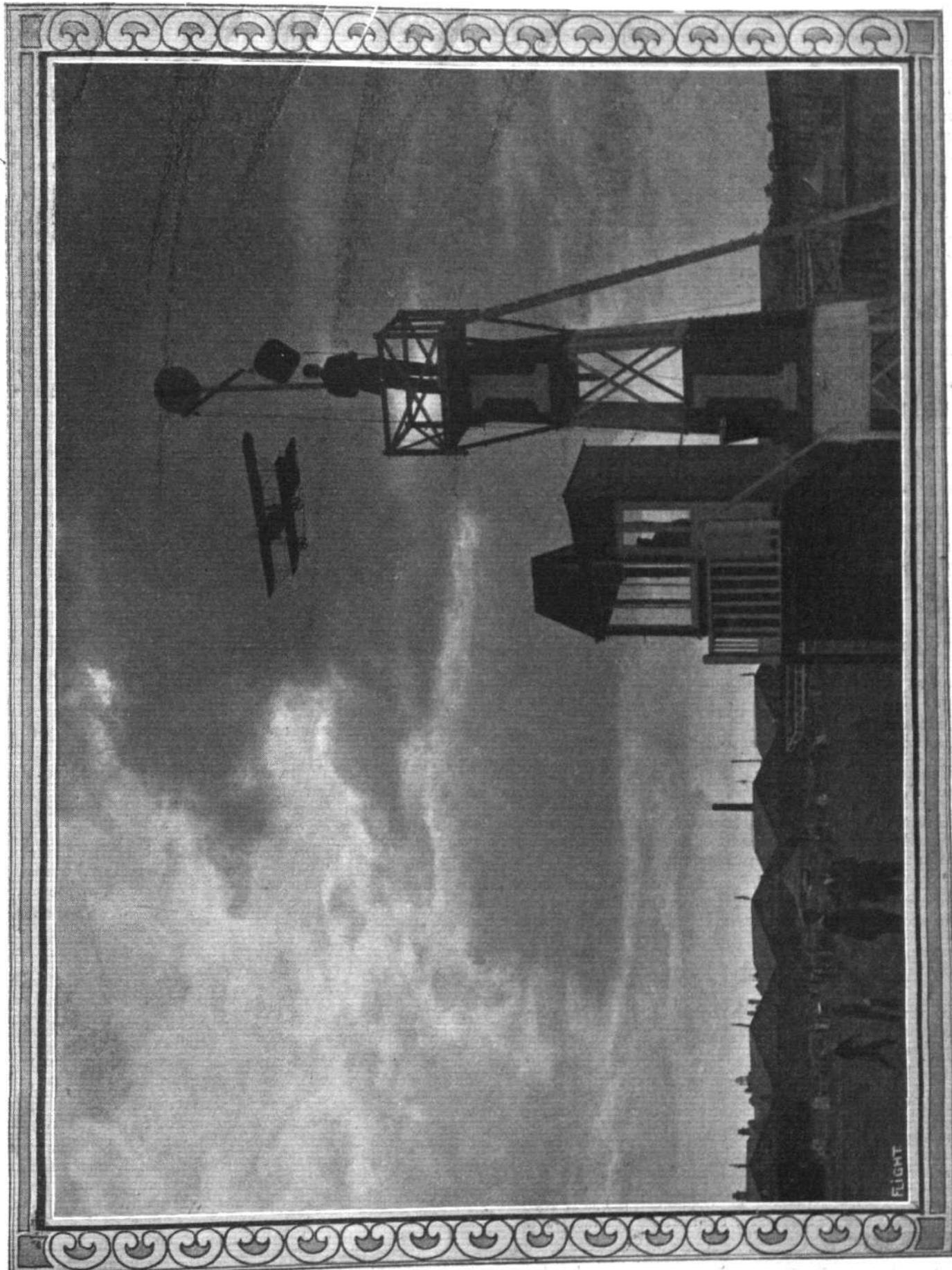
Already traders in many parts of the Metropolis are complaining of the loss that the reduced street and shop lighting has entailed on them, so that it is to be hoped the conditions which have necessitated the Order will soon pass away, and that London will quickly resume its normal aspect.

To some extent we are in sympathy with "Dagonet" to "Up Lights, and Drat 'Em," but our Naval and Military authorities, in their great task against our enemy, have so far won commendation on the way they have carried out their work, that we are inclined to feel that there is more than the eye sees in the continuance of this order, and that it would not have been imposed by the Admiralty without good and valid reason.

We firmly believe that they may be relied upon to remove it at the earliest practicable moment.

DECEMBER 4, 1914.

FLIGHT



A recollection of Hendon during the past season, with René Desoutter negotiating No. 1 pylon on a Caudron. Very different are the scenes there now under the régime of our Air Services.

AIRCRAFT WORK AT THE FRONT.

IN the despatch of Field-Marshal Sir John French, dated November 20th and issued on Monday, there was the following testimony to the work of the Royal Flying Corps (Military Wing):—

"The work performed by the Royal Flying Corps has continued to prove of the utmost value to the success of the operations. I do not consider it advisable in this despatch to go into any detail as regards the duties assigned to the Corps and the nature of their work, but almost every day new methods for employing them, both strategically and tactically, are discovered and put into practice. The development of their use and employment has indeed been quite extraordinary, and I feel sure that no effort should be spared to increase their numbers and perfect their equipment and efficiency."

There were the following references to aviation in the despatch, dated November 23rd, from an "Eyewitness" with the British Headquarters, issued by the Press Bureau on the 25th ult. :—

"The cold which set in on the 20th has continued without break. For three days the hard frost was accompanied by brilliant sunshine, but to-day, though the cold continues, the sky is clouded over. . . .

"Beyond the hardship inflicted on individuals, the change in the weather has chiefly affected aerial reconnaissance and the question of transport. The former has been much facilitated in two ways. In the bright sunlight and through the clear atmosphere the whole landscape is very clearly visible even from the height at which our aviators are forced to fly by the hostile anti-aircraft guns, while against the white background of snow entrenchments, roads, transport, rolling stock and troops show up most distinctly. On the other hand, the present cold experienced at high altitudes, intensified by the speed at which the aeroplanes travel through the air, greatly increases the rigour of the work. In spite of the employment of every device for retaining warmth, both pilots and observers have on some recent occasions returned so numbed that they have had to be lifted from their machines. . . .

"What is now considered as uneventful is not so in the peace sense of the world. It merely signifies that no active operation of any special vigour by either side has stood out from the background of artillery bombardment. This continues day and night with varying intensity, hardly ever ceasing altogether, and includes fire from the 42cm. howitzers—one of which is believed to be in use

against our left—down to that of the anti-aircraft spitfires.

"On our right centre our artillery made some good practice, especially in the neighbourhood of Neuve Chapelle, where it rendered some of the German trenches untenable. During the day (Friday, November 20th), much valuable information was obtained from aerial reconnaissance. . . .

"On the right centre (on Saturday November 21st) the German airmen were active, and dropped a bomb on Bailleul. This has no more useful effect in helping on their operations than most of the other similar exploits of their airmen, for the bomb dropped on the hospital. Being fitted with a sensitive fuse which acted on impact with the roof, it detonated midway through the ward just below before reaching the floor. Luckily the ward had just been vacated by forty patients, but one wounded man who had been left behind was again wounded. Every window within a large radius of the explosion was shattered.

"On our right a German aeroplane was forced to descend in our lines after an action in the air with one of our machines, and the observing officer and the pilot were made prisoners. They were found to be furnished with proclamations printed in Hindi recommending the native troops to desert.

"Sunday, the 22nd, was unusually quiet, and more like the Day of Rest than it has been for some time. On our left sniping was again countered by the use of shrapnel. Two more German aeroplanes were brought down, one was chased by one of our machines for some distance, during which a running fight was kept up, in which our aviator was slightly wounded in the hand. It then came down in our lines. When they landed the German observer and pilot appeared to be much surprised and disgusted to discover where they had descended. The officer who succeeded in forcing down this hostile machine had previously flown over Lille, where he had dropped several bombs on the aerodrome. The other aeroplane was also chased and forced to descend, but managed to do so inside the German lines."

In the despatch from "Eyewitness" dated November 26th, there was the following:—

"Our aeroplanes have been especially active in offence during the last few days, having dropped 123 bombs on various targets which need not be specified. One of our heavy howitzers, also, registered a direct hit on a railway station."

AN EDWARD BUSK

MEMORIAL FUND.

WE have received the following letter from the Superintendent of the Royal Aircraft Factory, announcing the inauguration of a scheme for the formation of an "Edward Busk Lecture Fund":—

"I enclose a graceful short poem which has been written 'In Memoriam,' E. T. Busk, by his school master, Rev. Walter Earle. This may perhaps interest your readers."

"An 'Edward Busk Lecture Fund' has been started as a memorial to Mr. Busk. Lord Rayleigh, who is subscribing, has authorised me to say that he is willing to allow his name to be quoted in support of the scheme.

"Particulars, names of trustees, &c., will be sent to you as soon as they have received the approval of the relations and those who have already subscribed to the fund.

"MERVYN O'GORMAN,

"Superintendent R.A.F."

"November 25th.

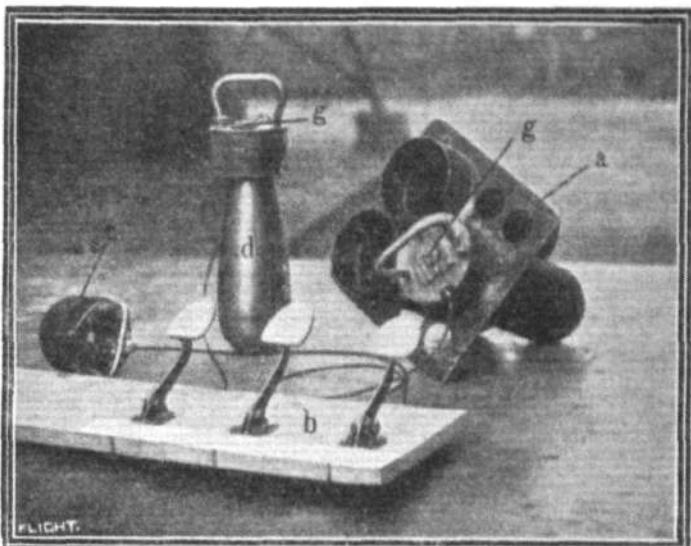
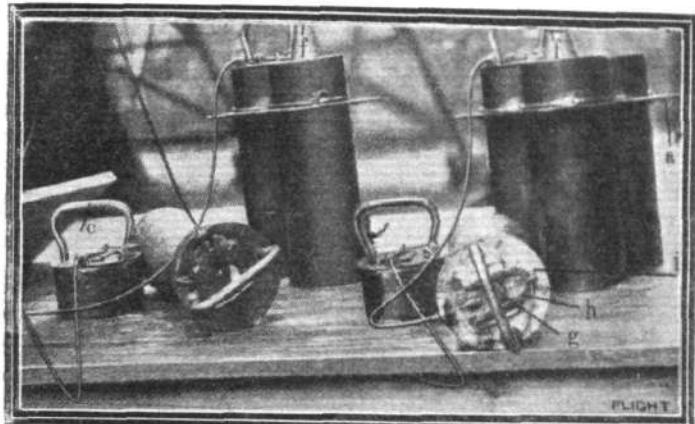
[* This sympathetic poem is reproduced on page 1176.—ED.]

This fund should receive the generous support of the aviation world, having in mind the extensive and valuable character of the work in connection with this branch of engineering which the late Mr. E. T. Busk was able to accomplish before his untimely death. The creation of such a Lecture Fund should do much to further our knowledge of the science with which we are particularly concerned in this journal, as we assume that the proposed lecture or lectures will deal with aeronautics; and we would venture to suggest for consideration to those who will be responsible for carrying out the objects of the fund the claims of the Aeronautical Society, the body responsible for the development of the scientific side of aviation in this country, and which is limited somewhat in its activities by reason of its lack of such endowments.

THE "ROLAND" BOMB-DROPPING APPARATUS.

The "Roland" bomb-dropping apparatus made by the Luftfahrzeug-Gesellschaft consists of three parts—the bomb tubes, the tube covers, and the pedal board. The plate (a) to which the three bomb tubes are secured is let into a square opening in the floor of the *fuselage* in front of the observer's seat. If the lower openings of the tubes happen to come directly over some part of the aeroplane, as, for instance, some portion of the chassis, a cylindrical guide tube of wire netting is placed beneath the bomb

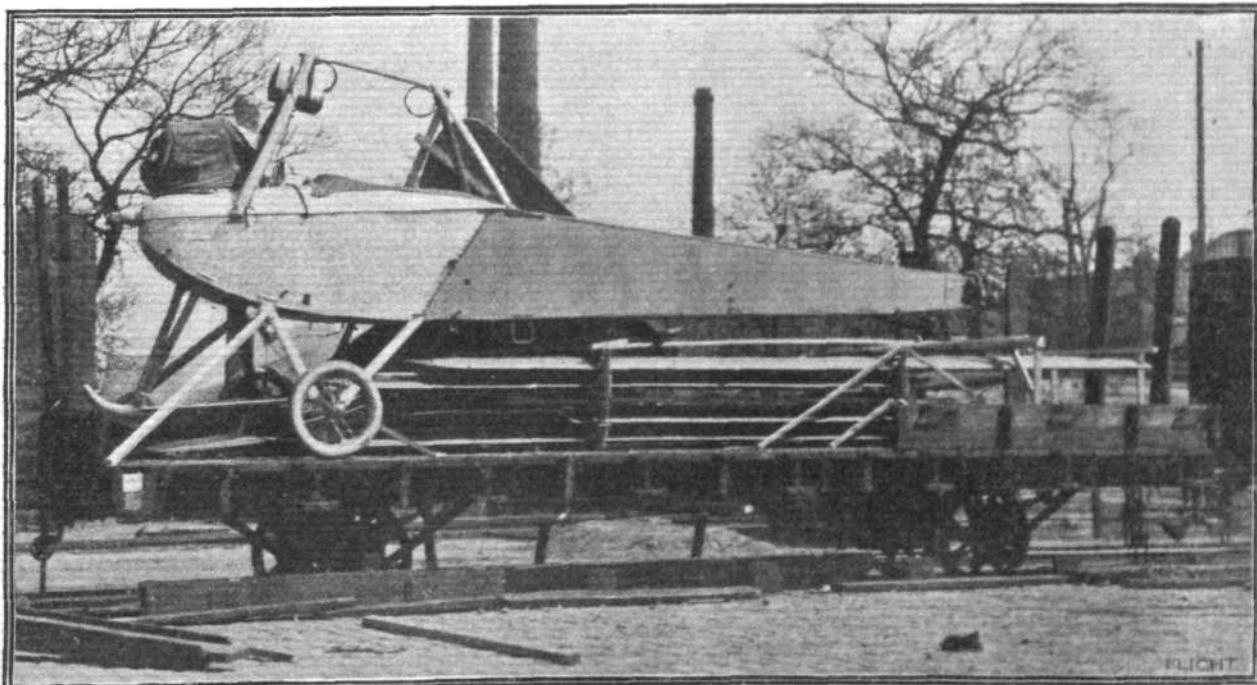
When the pedal is released, the spring (i) pulls back the fork (h) to its normal position, in which the fork engages with the circumferential groove in the neck of the bomb. When all three bombs have been placed in their respective



GERMAN AIRCRAFT BOMBS.—The "Roland" bomb-dropping apparatus.

tubes and suitably arranged to make the bombs clear all obstructions. The pedal board (b) is secured to the floor of the *fuselage* to the right of the observer's seat. The explosive charge is placed in a streamline casing (d). When getting ready to drop the bombs, the tube cover (c) is placed over the neck of the bomb, round which there is a circumferential groove (f). When the pedal corresponding to the bomb under consideration is depressed, it pulls back (by means of the Bowden cable) the sliding fork (h) on the tube cover and allows the neck of the bomb to pass up through the opening in the cover.

tubes in this manner, the plate (a) is placed over the square opening in the floor of the *fuselage* and the bombs are ready to be dropped. In order to do this the observer presses one of the pedals, thus withdrawing, by means of the Bowden cable, the fork engaging the slot in the neck of the bomb, which is now free to drop. The pedals and tube covers are painted in corresponding colours in order to obviate mistakes. The weight of the "Roland" bomb-dropping apparatus, exclusive of the bombs, is about 15 lbs. The advantages claimed for the apparatus are its simplicity, reliability and ease of refilling.



A German Military (L.V.G.) biplane loaded on a railway truck ready to be sent to the Front.



The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

SPECIAL COMMITTEE MEETING.

A SPECIAL MEETING of The Committee was held on Tuesday, the 1st inst., when there were present:—Prof. A. K. Huntington, in the Chair, Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Flight Lieut. F. K. McClean, R.N.A.S., Mr. J. T. C. Moore-Brabazon, Mr. C. F. Pollock, and the Assistant Secretary.

Election of Members.—The following New Members were elected:—

Flight Lieut. Reginald John Bone, R.N.A.S.
Sub-Lieut. Hugh Alvar Geaussent, R.N.V.R.
Sub-Lieut. Hugh Cunningham Morris, R.N.V.R.

Lieut. J. H. Towers, U.S.N., was elected a temporary Honorary Member of the Royal Aero Club until the 31st December, 1914.

Aviators' Certificates.—The granting of the following Aviators' Certificates was confirmed:—

970 Flight Sub-Lieut. Douglas Iron, R.N.A.S. (E.A.C. Biplane, Eastbourne School, Eastbourne). Oct. 28th, 1914.
971 2nd Lieut. John Eustace Arthur Baldwin (8th Hussars) (Maurice Farman Biplane, Netheravon School, Netheravon). Nov. 17th, 1914.
972 2nd Lieut. Erik Harrison Mitchell (Maurice Farman Biplane, Netheravon School, Netheravon). Nov. 17th, 1914.
973 Francisco Carabajal (Grahame-White Biplane, Grahame-White School, Hendon). Nov. 18th, 1914.
974 Capt. Gerald William Huntbach (4th King's Shropshire Light Infantry) (Maurice Farman Biplane, Netheravon School, Netheravon). Nov. 18th, 1914.
975 Lieut. Alan John Lance Scott (Sussex Yeomanry) (Maurice Farman Biplane, Netheravon School, Netheravon). Nov. 20th, 1914.

976 Alfred Huggins (Maurice Farman Biplane, Military School, Brooklands). Nov. 24th, 1914.

977 Flight Sub-Lieut. Eric John Hodsoll, R.N.A.S. (Grahame-White Biplane, Grahame-White School, Hendon). Nov. 25th, 1914.

978 Flight Sub-Lieut. Eric Fabricius Bray, R.N.A.S. (Grahame-White Biplane, Grahame-White School, Hendon). Nov. 25th, 1914.

979 Lieut. Michael Lloyd Braithwaite (Maurice Farman Biplane, Netheravon Flying School, Netheravon). Nov. 25th, 1914.

980 Flight Sub-Lieut. John Osborn Groves, R.N.A.S. (Grahame-White Biplane, Grahame-White School, Hendon). Nov. 25th, 1914.

981 Edward Stanley Skipper (Maurice Farman Biplane, Military School, Brooklands). Nov. 25th, 1914.

The following Aviators' Certificates were granted:—

982 Flight Sub-Lieut. Edmund Ivan Montfort Bird, R.N.A.S. (Bristol Biplane, Naval School, Hendon). Nov. 25th, 1914.

983 William Geoffrey Moore (Wright Biplane, Beatty School, Hendon). Nov. 26th, 1914.

Legion of Honour.

The following Members of the Royal Aero Club have been decorated with the Legion of Honour for their gallantry in the attack on Friedrichshafen on November 20th, 1914:—

Squadron Commander E. F. Briggs, R.N.A.S.

Flight Lieut. J. T. Babington, R.N.A.S.

Flight Lieut. S. V. Sippe, R.N.A.S.

Members are reminded that the Club premises are open until 4 p.m. on Saturdays.

166, Piccadilly, W. B. STEVENSON, Assistant Secretary.

THE BRITISH AIR SERVICES.

Royal Naval Air Service.

THE following were announced by the Admiralty on the 26th ult.:—

Messrs. O. Noel Walmsley and J. E. B. B. Maclean have been entered as Probationary Flight Sub-Lieutenants and appointed to the "Pembroke III," additional, for Royal Naval Air Service, with seniority Nov. 23rd.

Mr. J. D. Newberry has been entered as Probationary Flight Sub-Lieutenant for temporary service. To date Nov. 23rd.

Sub-Lieuts. W. L. Welsh and H. J. Batchelor, Royal Naval Reserve, to the "Pembroke III," for Royal Naval Air Service, as Probationary Flight Sub-Lieutenants. To date Nov. 25th.

Mr. J. W. Alcock has been entered as Acting Warrant Officer, Second Grade, and appointed to the "Pembroke III," additional, for Royal Naval Air Service. To date Nov. 19th.

The following were announced by the Admiralty on the 27th ult.:—

Lieut.-Commander G. C. Thomas, retired, to the "Pembroke," additional, for anti-aircraft duties. To date Nov. 26th.

Lieut. C. M. Murphy transferred to Royal Naval Air Service as Acting Flight Lieutenant, and appointed to the "Pembroke III," additional, for Royal Naval Air Service. To date Nov. 20th.

Temporary Second Lieut., R.M., B. S. Benning, appointed Flight Sub-Lieutenant to the "Pembroke III," additional, for Royal Naval Air Service. To date Nov. 16th.

The following was announced by the Admiralty on the 28th ult.:—

Temporary Surgeon A. R. McMullen to the "Pembroke III," additional, for Royal Naval Air Service. To date Nov. 27th.

The following was announced by the Admiralty on the 30th ult.:—

J. S. Mills, entered as Probationary Flight Sub-Lieutenant, and appointed to the "Pembroke III" for Royal Naval Air Service. To date Nov. 27th.

The following was announced by the Admiralty on the 1st inst.:—

Temporary Surgeon—H. G. Parker, M.B., to the "Pembroke III," for Royal Naval Air Service. To date Nov. 30th, 1914.

The following appeared in the *London Gazette* of the 1st inst.:—

Royal Naval Reserve.—The undermentioned Acting Flight Lieutenants have been confirmed in the rank of Flight Lieutenant for temporary service in His Majesty's Fleet: Henry Richard Busteed, dated Aug. 3rd, 1914; Sidney Vincent Sippe, dated Aug. 4th, 1914; Harry Delacombe, dated Aug. 6th, 1914.

The following was announced by the Admiralty on the 2nd inst.:— Probationary Flight Sub-Lieutenant W. G. Moore to the "Pembroke III," for Royal Naval Air Service. To date Dec. 1st.

Royal Flying Corps (Military Wing).

THE following appeared in a supplement to the *London Gazette* issued on November 26th:—

The undermentioned appointment is made: Wing Commander Maj. Edward B. Ashmore, M.V.O., Royal Artillery, from a General Staff Officer, Second Grade, and to be temporary Lieutenant-Colonel. Dated Nov. 18th, 1914.

Special Reserve of Officers.—The appointment of William L. Hardman to a Second Lieutenancy, which appeared in the *London Gazette* dated July 25th, 1913, is cancelled.

The following appeared in a supplement to the *London Gazette* issued on November 28th:—

Supplementary to Regular Corps.—Second Lieut. Denys Corbett Wilson to be Lieutenant. Dated November 11th, 1914.

Julian Pauncefote Inglefield to be Second Lieutenant (on probation). Dated November 23rd, 1914.

The following appeared in a supplement to the *London Gazette* issued on the 30th ult.:—

Lieut. Arthur B. Bagley, Royal Dublin Fusiliers, to be a Flying Officer and to be seconded. Nov. 17th, 1914.

The following appeared in the *London Gazette* issued on December 1st:—

The undermentioned temporary appointment is made.—Second Lieutenant Arthur V. Bettington, Special Reserve, to be a Flying Officer. Dated Nov. 11th, 1914.



The Roll of Honour.

THE following casualties in the Expeditionary Force were reported from General Headquarters under date November 23rd:—

Officers Wounded.

Hughes-Hallett, Capt. H. H., N. Staff. Regt. and Royal Flying Corps.

Lorraine, Second Lieutenant R., Royal Flying Corps.

CASTINGS MADE UNDER PRESSURE.

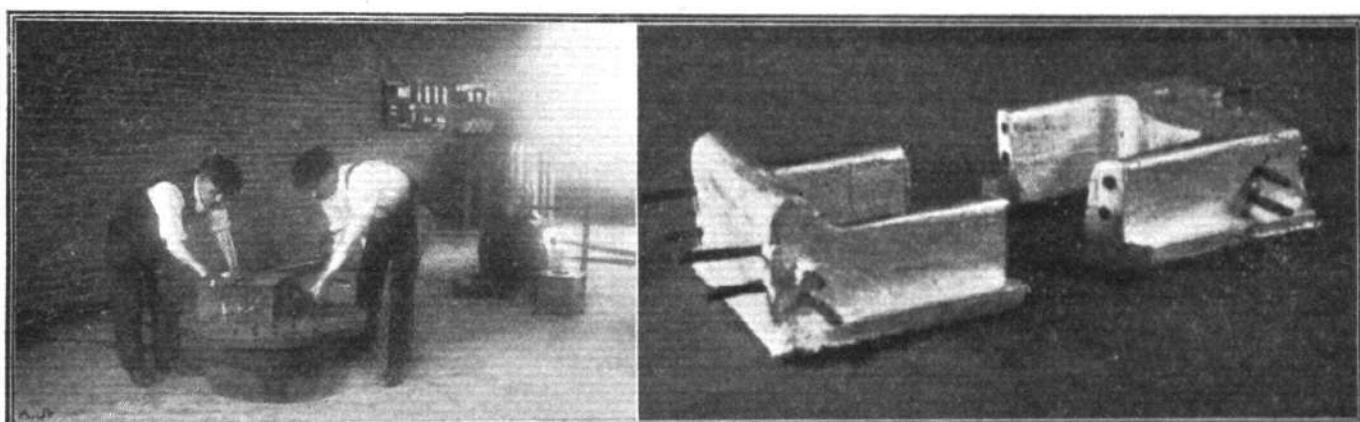
THERE are few engineering trades in which the methods of manufacture have not undergone considerable revision during recent years. In some cases the innovations made have practically revolutionised certain processes incidental to manufacture, but in others the old methods still exist, and such improvements as have been introduced have from their nature been supplementary. This has been particularly the case in the foundry, as apart from the progress which has been made in the scientific side of the trade, time has wrought comparatively little change in the mechanical operations involved—the improved quality and greater quantity of the work produced being, to a large extent, due to the installation of new machines.

Interest therefore attaches to the system of casting under pressure and method of reinforcing castings of the Combined Metals and Reinforced Castings Company, Point Pleasant, Wandsworth, S.W. Pressure casting, as such, is by no means of recent introduction, but the particular manner in which the pressure is obtained in this case is claimed to be quite new, and the subject of a patent by Mr. W. F. Sollis. The preparation of the mould from the pattern differs in no wise from the usual

a short time after pouring has been completed, the small head of metal within the box is sufficient to make up for shrinkage in cooling.

The immediate benefit derived from this system of casting is that much sounder and more homogeneous castings are ensured with any metal than are obtainable by the more usual method, so that there should be a much lower proportion of "wasters"—an important source of loss in foundry work—the castings should be stronger, and there should be less liability to failure through undiscoverable defects. Another advantage of the system is that it should permit of much thinner castings being made, an especially desirable point when dealing with metals that are sluggish in the mould.

As regards the system of reinforcing the metal, this system has a double object where aluminium castings are employed—the attainment of greater strength and a wider margin of safety. The reinforcement employed depends upon the form of the article to be cast, and consists either of galvanised or tinned steel wire frames or of steel rods which vary in diameter according to the size and shape of the casting. These are placed in the



PRESSURE CASTINGS.—On the left, the plant used to obtain the pressure upon the metal by centrifugal force during casting. On the right, an aluminium reinforced pressure casting.

"Flight" Copyright.

method—the pattern is embedded in the sand in the boxes, and after the sand has been rammed down the pattern is removed and such cores as may be required are inserted. The mould, when ready for casting, however, differs in one respect in that there is no special vent for the gases, as the pressure obtained during casting is sufficient to force the gas through the sand and the interstices between the boxes.

The box is then removed to a platform that resembles in appearance the face plate of a lathe, with its axis vertical and secured thereto, by clamps and bolts, in such a position that the hole through which the molten metal is poured is immediately over the centre of the face plate. The face plate is driven at a speed of about 100 revolutions per minute through a countershaft by means of an electric motor, as shown in one of the accompanying illustrations, and while rotating, the molten metal is poured into the mould. The metal flowing into the mould is immediately acted upon by centrifugal force, and consequently, no matter how intricate the casting, the molten metal is caused to penetrate under increasing pressure to the most remote portions of the mould. In addition, the use of "headers" under ordinary circumstances, in order to force the metal through to all parts, is entirely unnecessary, as by continuing the rotation for

mould in the positions required, and the pouring is proceeded with in the manner previously described. The object of tinning or galvanising the wire is to ensure the better adhesion between the cast metal and the reinforcement. Where rods are employed for reinforcing the metal the wires are of other than circular section, and are twisted in order to give greater resistance to drawing out. One of the illustrations shows a reinforced casting in the condition in which it was removed from the mould.

Tests conducted by Faraday House upon reinforced aluminium rods cast under pressure show that the strength of such rods is practically doubled; and this increase in strength is obtained by an increase in weight of approximately 16 per cent. The average breaking load in tests made by Faraday House on three such rods was 13.75 tons per square inch. Apart from this increase in strength, however, a valuable feature of the reinforcement is the safety it affords. In the tests the aluminium broke first, as was to be expected, but before the test piece completely failed by the fracture of the steel rod the aluminium was broken in five places.

The system is one which has considerable interest for aeroplane constructors, and in fact the firm have in hand some work for one of the largest aeroplane manufacturers in this country.

E. T. BUSK—IN MEMORIAM.

ENGINEER. INVENTOR. AVIATOR. PATRIOT.

(Who met with his Death, November 5th, 1914, on Laffan's Plain, in an Aeroplane which caught fire.)

By the Rev. WALTER EARLE.

Spirit of Man,—had I not known thy love
For Mother here on Earth, thy laugh, thy sigh,
I should have thought thy home must be above
In some far distant sky.

Unselfish,—Guardian of thy Country's fate,
Of England's honour, England's very own,—
The Empire claimed thee in its perilled strait,
Thou couldst not rest alone.

Thy knowledge ever plumb'd each depth and height,
Thy soul and mind would have the mastery ;
No stay in darkness for the Son of Light,—
"More Light, more Light," thy cry !



U.S. President and Bomb-Dropping on Open Towns.

THE *Daily Telegraph* correspondent at Washington on Friday last telegraphed :—

"President Wilson has communicated with the United States diplomatic representatives with the belligerent Powers, instructing them unofficially to advise the heads of those nations of the United States' disapproval of attacks on unfortified cities by aerial bombs. The diplomats are cautioned not to make their representations official in character, as the President does not want to put the United States in the position of meddling. This became known definitely to-day, but the action of Dr. Wilson was taken nearly two months ago, or soon after protests were received from the Kaiser and President Poincaré.

"I am informed on high authority that Great Britain has unofficially notified the United States of her intention of following President Wilson's wishes as far as practicable, that France did the same, but that Germany has made no reply. The destruction of cathedrals and several small towns in Belgium and France is said to have induced President Wilson to take this action.

"In his communications to the American diplomats Dr. Wilson did not mention any specific incidents in which unfortified towns had been attacked. My informant understood that President Wilson will take no further action in this direction, as he feels that to go further would be overstepping the bounds of propriety."

In a subsequent message it was stated :—



The Zeppelin Raid and Flying Over Neutral Countries.

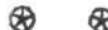
IN the House of Commons last week, Mr. Booth asked the Prime Minister if instructions were given to the aviators who bombarded the Zeppelin sheds at Friedrichshafen to avoid neutral territory ; and what is the policy of his Majesty's Government with regard to the passage of warlike machines over the land or territorial waters of neutral countries.

Mr. Churchill, who replied, said : Instructions were given to the naval flying officers who attacked the Zeppelin factory at Friedrichshafen to avoid neutral territory, and the course drawn on the maps supplied to them should have taken them well clear of Switzerland. When machines are flying at a great height it is almost impossible

Intrepid, facing every risk,—the wind
Thy wings, the clouds thy fiery chariot-seat,—
Unvanquished yet, thou rodest forth to find
Where Earth and Heaven meet.

A child in years, a veteran in lore,
Thou must go forward to new destinies,
Flesh can ensathe thy Spirit-spark no more,
Whose Home is in the skies.

Loud booms the " Soldier's Peal,"—the " last Post " rings,—
Hearts burst with ceaseless sob and streaming tear ;
Thou passeth on to thy great King of Kings,—
Oh Mystery of Life !—Thou still art here.



"So far Dr. Wilson has not discussed the subject for publication, and has confined himself to conferences with diplomatic representatives of the belligerent Powers, who were reminded of the article in The Hague Convention which provides for a notice of twenty-four hours of the purpose to attack a zone inhabited by non-effective, to enable such persons within that time to remove themselves from the danger zone.

"If this is true," comments the *New York Sun*, "it is, perhaps, the most important news concerning America's relation to the war in Europe that has appeared since the beginning of August. Its surpassing importance is due to the fact that, if true, it would indicate the Administration's acquiescence in the urgent demand of thousands of well meaning persons throughout the country that this Government, as one of the signatories of the Conventions of The Hague, shall do its duty with regard to infractions of the rules of warfare supposed to be contained in these conventions."

According to the *New York World*, all the belligerent powers "have accepted favourably" President Wilson's informal protest. This paper also stated that the President "so well succeeded in avoiding any distinct imputation that the German Ambassador was among the first to signify his approval of the stand made by this Government." It also pointed out that there have since been no further aerial attacks on cities.



or any but a skilled observer to determine with any accuracy the course the aircraft are taking unless he is directly beneath them. No agreement was reached at the Paris Conference, 1910, in regard to the passage of belligerent aircraft over neutral territory.

The Anti-Aircraft Service.

REPLYING to a question in the House of Commons by Major Murray, Dr. Macnamara, Secretary to the Admiralty, said that the hours of the anti-aircraft service, four and a half to five every second night, had not been objected to by the men, but should any officer or man find the strain too great his post could, no doubt, be filled from the large waiting list, which now amounts to several hundreds.



ENEMY PATENTS RELATING TO AERONAUTICS.

LIST of British patents which have been granted in favour of residents of Germany, Austria, or Hungary, specially compiled for FLIGHT, by Lewis Wm. Goold, Chartered Patent Agent, Enrolled Patent Attorney in the United States, 5, Corporation Street, Birmingham, who will supply full copies of any of the patents, price 8d. each, and from whom the latest particulars upon the Register of Patents can be obtained.

Furnished in view of the new Patents Acts, which empower the Board of Trade to confer upon British subjects the right to manufacture under enemy patents.

No. 3943/11. Aerial machines, without aerostats ; planes, arrangement and construction of ; propelling ; steering ; parachutes. Sack, O., Germany.

No. 4477/11. Gyroscopic apparatus ; flying machines are steered vertically, and at the same time maintained in lateral equilibrium, by means of an horizontal gyroscopic wheel,

which is mounted so that it may be tilted longitudinally, but not laterally, with respect to the machine. Weiss, A., Germany.

No. 5070/11. Steering by propellers of adjustable pitch. Mees, G., Germany. Dated May 20th, 1910.

No. 5071/11. Propelling ; balancing. Mees, G., Germany. Dated July 14th, 1910.

No. 5953/11. Cars, landing. Detachable waterproof cushions, containing the seed-hairs of the kapok plant, are attached to the cars of aerial vehicles, so that if obliged to alight on water the cars float. Stark, E. G., Germany. Dated February 6th, 1911.

No. 6527/11. Aerostats ; to prevent deformation of the envelope, the outer framework is stayed by ropes or the like passing through the gas-bag and connecting oppositely-disposed points of the framework. Schutte, J., Germany. Dated April 14th, 1910.

EDDIES.

FOR some time past there have been indications that the old order of things at Hendon was about to pass away. The ever-increasing number of naval pupils undergoing their training in the aviator's art has reached such dimensions that several of the private firms have been simply "crowded out." In consequence of the scarcity of hangars and "air space" a general emigration from Hendon may be anticipated, and the question arises: Where will the exiles find new homes? The problem of finding a suitable ground within easy reach of London, although it should not present insuperable difficulties, is not an easy one to solve, as a ground for school purpose, in addition to being level and smooth, must also be conveniently situated. It is also desirable that it should be surrounded by other fields in which landings might be effected in emergencies. Proximity to a railway station is another desirable, if not necessary, factor as it will facilitate getting raw materials for spare parts or new machines transported to the ground. If any readers happen to know of any good sized ground which they think would be suitable for a flying ground I should be pleased to hear from them.

x x x

Among the firms who are giving up their sheds at Hendon are the British Caudron Co., who are, I hear, contemplating the taking of a large works in the vicinity, where they will be better able to turn out their excellent machines at a more satisfactory rate than they could possibly do in the small works in which the well-known little blue biplanes have hitherto been built. When the new factory is finished, things are likely to hum at the Caudron works, for I have a strong suspicion that they have some very interesting things in the way of new machines up their sleeve.

x x x

It is good news indeed to hear that Frank Goodden, who, it will be remembered, had a rather nasty spill on one of the machines at Farnborough some little time ago, is now quite himself again and is flying in his usual masterly style. It is to be hoped that Goodden's good fortune, which had temporarily deserted him will prove more faithful in the future and help him to carry out successfully the highly important work that he is now engaged upon at Farnborough.

x x x

One of the pupils at the Beatty school, Mr. W. A. Moore, had a thrilling moment the other day when doing "eights" for his *brevet*. Just as he was starting off another machine got in front of him, and in order to avoid a collision Moore pulled back his control wheel as far as it would go and shot upwards at an alarming angle. Those who witnessed the performance estimate the "jump" to have been about 100 feet high. Everybody held their breath and waited for a tail slide or a side slip. The machine seemed to be almost stationary when Moore was seen to "jerk her round" as Beatty put it and brought her down a little. Nothing daunted he then proceeded to carry on "business as usual," completing his "eights" in graceful curves.

x x x

Another Hendon pupil who has shown exceptional ability is Mr. J. Rose, who took his certificate at the Hall school a short while ago, and who has proved so

adept at the lever of the Hall machines that he has now been appointed instructor to that school, where his knowledge of all the biplanes in use should stand him in good stead. His genial personality should soon make him very popular among his pupils, and as he has a very good knowledge of the engineering side of aviation he will be able to impart valuable information on the subject of construction.

x x x

Evidently Hucks is having a busy and exciting time on active service, to judge from a letter which he has sent to a friend. His account of some of his flying is so interesting that I am tempted to quote it.

"On a reconnaissance flight a few days ago, for the purpose of observing the effect of gun-fire, we were heading into a strong wind, blowing, I should think, between fifty and sixty miles per hour, at a height of 6,000 ft. above the German lines. Consequently we made very little progress, and remained almost stationary. This suited our purpose admirably, as it made our operation of watching our gun-fire easier. But it also suited the gunners of the German anti-aircraft guns (we call these guns 'Archibalds'), for they fired on us shell after shell.

"We stuck on, knowing how difficult it is to get such a target as an aeroplane, which at 6,000 ft. looks a wee speck. I saw and heard the shells bursting around us, and we had just finished observing the last gun fired when—crash, and the left plane opened up and I realised we had been hit. A hole big enough to get through, with the torn fabric flapping away in the wind, was altogether too good a reminder of the situation.

"One's feelings under these conditions can better be imagined than described, as the horrid uncertainty of the real extent of the damage, and the consequent expectancy of the whole machine crumpling up and crashing to earth, gave me a somewhat anxious



Mr. J. Rose, Instructor at the Hall School, Hendon, who recently obtained his *brevet* on the school 45 h.p. Caudron. His altitude in the test was 1,500 ft.

time in getting to earth. However, I managed to get back, and found that the machine was so badly damaged that it had to be sent back to the base to be rebuilt. The piece of shell had passed through the plane, carrying away two ribs, a main strut, petrol pipes, and passed just between my passenger and myself. Taking

all this into consideration, one may call it a miraculous escape. I had another bullet in my main spar the other day, which split it badly. However, these little things are sent to try us. . . . The weather makes our work rather difficult just now."

"AEOLUS."



FROM THE BRITISH

Brighton-Shoreham Aerodrome.

Pashley Bros. and Hale School.—During last week, up with instructors, J. Morrison, A. Goodwin, G. Charley. Circuits and eights, T. Cole, C. Winchester, J. Woodhouse, Menelas Babiotis, F. De Courcy Gibble. Machines in use:—Pashley and H. Farman biplanes.

Eastbourne Aerodrome.

INSTRUCTORS during last week F. B. Fowler, R. C. Hardstaff. With instructor on E.A.C. biplanes, Flight Sub-Lieuts. Pullin, Barnes, Travers, Teesdale, Wood, Sibley, Openshaw, Gerrard.

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Tuesday last week, Probationary Flight Sub-Lieuts. Barnes, Breese, Dalison, Driscoll, Field, Livock, straights with Instructors Manton, Shepherd, Russell and Winter. Probationary Flight Sub-Lieuts. Field, Cooper, Wakeley, Watson, Young and Mr. Greenwood straight flights alone. Probationary Flight Sub-Lieuts. Bray, Groves, Hodsoll, Price, Watson circuits 8s, &c., and Cooper half-circuits.

Wednesday, Probationary Flight Sub-Lieuts. Dalison, Breese, Driscoll, Barnes, Livock, straights with Instructors Manton, Shepherd, Russell. Probationary Flight Sub-Lieuts. Cooper, Field, Wakeley, Young, and Mr. Greenwood straights alone. Probationary Flight Sub-Lieuts. Bray, Groves, Hodsoll, Price, Watson, solo circuits, eights, &c., and Cooper and Wakeley half-circuits alone, afterwards Probationary Flight Sub-Lieuts. Bray, Groves and Hodsoll competed for and obtained their pilot's certificate in fine style.

Beatty School.—Monday, last week, weather very bad so no solo school work possible. Pupils receiving instruction during the week with Mr. Geo. W. Beatty and W. Roche-Kelly on "dual" controlled 50 h.p.



CORRESPONDENCE.

Enemy Patents—and a Valuable Explanation.

[1890] I observe a list of "Enemy Patents Relating to Aeronautics" in your issue of November 27th, which is stated by your correspondent to be "furnished in view of the new Patents Act, which empowers the Board of Trade to confer on British subjects the right to manufacture under enemy patents."

An incomplete statement is liable to mislead your readers, especially in view of the fact that a widespread impression prevails that British patents which have been granted to German and Austrian subjects may now be freely used by Britishers anxious to capture German trade. The Board of Trade certainly have power under the 1914 Act to avoid, suspend, or grant licences under British patents owned by alien enemies. In consequence, however, of the misunderstanding of the objects of this Act, numbers of applications have been made to participate in an apparently liberal division of the enemy's property; but those so eager to participate in the plunder have been considerably discomfited on finding that the Act is not intended, and is not permitted, to be used for plundering the enemy in this way.

The object of the 1914 Act is to see that British trade is not jeopardised or interfered with owing to the existence of British patents which, being owned by enemies in Germany, cannot be dealt with owing to the breakdown of communications between the two countries. Consequently, the Comptroller-General of Patents sits in his court to decide on applications brought before him, and hitherto he has not avoided or suspended any particular patent, but

FLYING GROUNDS.

Gnome biplane and 40 h.p. Wright biplane:—Messrs. Virgilio 15, Gardner 48, C. Leeston-Smith 30, W. G. Moore 45, J. D. Newberry 15, Anstey-Chave 38, G. Donald 35, G. Perrot 5, J. F. Roche 25, B. de Meza 15, J. V. Miller 15, and P. E. Cornish 15.

On Wednesday, Mr. W. G. Moore flew for his certificate, which he obtained after a fine series of flights. During his height test he attained a height of 2,000 ft., making a fine spiral *vol plané* from 1,600 ft., and finishing with a perfect landing. He has now been accepted as Probationary Flight Sub-Lieut. in the R.N.A.S., as have also Messrs. J. D. Newberry, Anstey-Chave, and C. Leeston-Smith. M. Edouard Baumann has now returned from Switzerland, having been released from his duties with the Swiss Army, and will immediately take up his duties as instructor.

British Caudron School.—On Monday, last week, too windy for school work.

Tuesday, morning misty. School out at 11.30 a.m. Sub-Lieut. Bird and Mr. Stevens right and left hand turns. Mr. Williams rolling. Evening, school at 4 p.m. Instructor, R. Desoutter. Mr. Stevens doing $\frac{1}{2}$ circuits. Wednesday, windy.

Thursday, school at 8 a.m. under instruction of R. Desoutter. Lieut. Bird and Mr. Barfield circuits and figures of eight, both making good progress. Mr. Barfield almost ready for his *brevet*.

Friday, windy. Saturday, very wet.

London and Provincial Aviation Co.—School instructors at work during last week, Messrs. W. T. Warren and M. G. Smiles. Pupils being instructed on L. and P. biplanes. Messrs. Moore, England Derwin, Abel and White.

Weather throughout the week mostly unfavourable.



in cases where the applicant can show that there is a demand for the patented article, and that he will undertake to supply the patented article in Great Britain, then on the applicant also agreeing to pay a reasonable royalty, the Comptroller recommends the Board of Trade to grant the licence applied for. In most cases which have been brought before the Comptroller, counsel or a patent agent appears on behalf of the applicant, and the German patentee is similarly represented in order to resist the application or to exact better terms on behalf of the alien enemy. Quite apart, therefore, from the court fees involved, some expense is entailed in legal charges.

The selection made by your correspondent of the twelve German-owned patents is not encouraging from a practical aviation point of view, one patent being for propelling aerial machines or aerostats by means of valved planes; another for a flying machine provided with lifting screw propeller; others for balloons for airships, valved propelling blades, aerial machines for aerostats, parachutes, &c. Judging from the short particulars given in this list, the owners of these patents would be the last to resist applications to exploit their inventions, if some venturesome individual in England undertook not only to pay a reasonable royalty, but undertook the manufacture and supply of the patented inventions to the British public at the British manufacturer's own risk.

However, if some readers of FLIGHT desire to exploit German "Kultur," they may now go to the Board of Trade to arrange terms instead of going direct to the German inventor.

GRIFFITH BREWER.

33, Chancery Lane, London, W.C., November 30th.

AIRCRAFT AND THE WAR.

At a meeting in support of the Emergency Fund of the Waifs and Strays Society on the 23rd ult., Sir Cecil Hertslet, who was British Consul-General for Belgium, gave the following interesting details of the Zeppelin raids on Antwerp:—

“Darkness had proved a very efficient protection against Zeppelin raids. Nothing was more nerve-racking than a Zeppelin raid. A great airship many feet longer than Canterbury Cathedral, came sailing over Antwerp at dead of night and dropped one of its enormous bombs without a moment's warning. Immediately afterwards it was fired at by riflemen and by the heavy guns at the forts, but all the time it kept dropping bombs, and for some minutes it was like a bombardment. Eleven people were killed, and every bomb dropped close to the building aimed at.

“At that time the City was brilliantly lighted, but the following day orders were given for all lights to be put out at eight p.m. The darkness of London was nothing compared with the darkness of Antwerp from that day onwards. To him London appeared to be quite light at night after his experience of Antwerp, where the absolute darkness could almost be felt. But in spite of that there were no cases of violence or robbery, and when the second Zeppelin came it did scarcely any damage at all, and killed no one.”

Writing with reference to the present state of Germany's aerial equipment in the *Field* of November 21st, Mr. T. F. Farman said:—

“At the very commencement of the war the French made an imprudent rush to Mulhausen, which they occupied. They were, however, soon driven out of that Alsatian town by the Germans. Nevertheless, it was reported they had destroyed the Aviatik aeroplane factory, the most important possessed by the enemy. It appears such was not the case, because it has been ascertained that on the very first day of the mobilisation the German military authorities transported from Mulhausen to a town in the centre of the Empire all the Tauben housed at the Habsheim aerodrome, and also the unfinished machines in the Burzweiler factory, together with the plant and materials. No fewer than fifty railway vans were employed for that removal. Since then it is said that the Germans have continued constructing as many Tauben as their factories, working day and night, can produce. It may appear strange that, as most strenuous efforts are being made to reinforce the German fleet of aerial craft heavier than air, the action of the Tauben does not make itself felt with increasing effect in the campaign. An explanation of the failure of the German aeroplanes to render all the signal services expected of them may be found in the fact that for fighting purposes their machines are handicapped by the position of the motor and propeller in front.

“However that may be, it is interesting to note that a retired officer of the Belgian army, who has just reached Paris from his country, declares that he recently obtained reliable information on the subject from a German aviation officer whose acquaintance he made at an hotel in Antwerp, where they occupied contiguous rooms. The German aviator told him that on the outbreak of war the Germans possessed 260 Tauben, of which there are, however, at the present moment only 60 left. The Belgian having suggested there could be no great difficulty in replacing the wrecked machines the German aviation officer replied, ‘You are quite right. But it is more difficult to get good pilots.’ The same remark must hold good with even greater force in the case of Zeppelins, of which an American gentleman who recently returned from Germany was assured the Germans now possess no fewer than 80, and that 50 more are being built. The assertion, of course, was nothing more than a stupendous bluff; but, even were it true, the announcement would fail to strike terror in the Allies, who know the Zeppelins, however numerous they may be, are doomed to disappoint the hopes founded on them by the Germans. Moreover, it is evident that, if it is not easy to find good aviators to man aeroplanes, it is much more difficult to train men to pilot steerable balloons.”

In a letter home Lieut. Douglas Beatty of the Army Service Corps thus described an aerial duel over Hazebrouck on the 20th ult.:—

“We experienced great excitement at railhead yesterday. It was a beautiful day, perfectly cloudless, and a couple of English aeroplanes were flying overhead. Then a German Taube appeared, and the Guards fired with their rifles. All of a sudden there was a fearful bang and a bright flash in a field about 100 yards from where I was standing, followed by two others a little further off.

“The bally German was letting fly at us with bombs. A little later two more German planes appeared. Some of our artillery must have seen them, for soon we could see shrapnel bursting all

around them. There was a bang and a yellow, flamelike flash, a little cloud of yellow smoke, and the shell had burst. Suddenly one of the German Taubes seemed to crumple up, and fell to earth like a stone.

“Then came an English biplane, and he and the remaining German manœuvred about for ages to get the higher position. Ours seemed much quicker, and our chap got on top. There were a few faint bangs and flashes, and the old German came down disabled. It was exciting watching it.”

A *Daily News* correspondent in North-East France wrote on the 24th ult.:—

“Yesterday at Bailleul a German aeroplane was engaged by an English aviator in an aerial duel, and after successful manœuvring the German was wounded in the arm by a revolver shot from the English aviator and forced to descend. Another German aviator with his machine is also reported to have been destroyed within the English lines round Ypres. Since Friday there has been no repetition of the bomb throwing.”

A *Morning Post* correspondent at Amsterdam reported on the 25th ult.:—

“In order to protect their coastal fortifications from attacks by aeroplanes, the Germans have sent to Ostend seven aerial guns from Essen via Aix-la-Chapelle. Many guns have been forwarded to Laon.”

Writing to the *Daily Telegraph* from North-Eastern France on November 25th, and describing the struggle for Ypres, Mr. A. Beaumont said:—

“There are armoured motor-cars and railway carriages which have been run on the roads and railway lines to Commines, Langelmark, and Roulers, and returned, and with the sound of the guns and the explosions of the shells are mingled the reports of the bombs thrown almost daily by the enemy's aeroplanes, which are in turn again chased and often brought down by the aeroplanes of the Allies.

“Five or six of these enemy aeroplanes were destroyed only recently, but before they were brought down they had thrown bombs which killed several non-combatants.”

The *Daily Mail* on the 25th ult. published an article giving the views of a traveller who has just returned to England from Belgium, where, it is stated, his position gives him exceptional opportunities for observation. The following is an interesting extract:—

“There are two things of which the German soldier has a most wholesome dread—the British aeroplanes and the Gurkhas. A British aeroplane, I am told, appeared over a Belgian town the other morning when the German military band was playing on one of the public squares. A small boy crept up behind the bandsmen and cried: ‘Englische Flieger’ (English airmen), whereupon the melody being played wandered off into a hideous medley of discords. The bandsmen were too disciplined to stop playing without orders, but every man, with sickly apprehension depicted on his face, craned his neck skywards while attempting to play his instrument, with disastrous results.”

A correspondent of the *Times* writing from Radom on November 2nd, after describing the scattered marching tactics of Russian infantry, said:—

“I am told that this method of marching has proved a great puzzle to the airmen of the Germans trying to estimate the numbers of troops that are moving; for when the columns are so strung out it is almost impossible from any height to tell whether what one sees is a battalion in close formation or a company strung out. Most armies march in solid masses, which can be seen on the roads for long distances, and their strength judged to a nicety.”

A *Morning Post* correspondent at Dover, describing the return of the warships which had bombarded Zeebrugge, said:—

“There were four ships engaged in the bombardment, some splendid reconnaissance work having been carried out by seaplanes from the base in question at the end of last week. Excellent information as to the dispositions of the enemy along the coast and at Zeebrugge was thus available for the Admiral in command of the operations.”

Inquiries which have been made by the *Matin* go to show that the aluminium plates used in the construction of Zeppelins are entirely manufactured at Schaffhausen (Switzerland).

On November 27th the *Morning Post* correspondent in Belgium sent a translation of the German Minister of War's letter of advice on the training of the new German armies. In the course of this document, which was dated September 26th, was the following:—

"The rôle of the aeroplane in war has taken on an unexpected degree of importance. Their work should be carried on in very close connection, not only with the general command but also with the artillery command. Every possible effort should be made on the manoeuvre grounds to train for a close co-operation and a reciprocal understanding between the aeroplane service, the general command, and the artillery.

"Aviators on reconnaissance should be provided with pistols and hand grenades. Though these latter produce no appreciable results for the most part, nevertheless they have an important effect in creating alarm among the enemy, and should therefore be employed."

Regarding the aerial raid on the Zeppelin works at Friedrichshafen a *Daily Telegraph* correspondent wrote thus from Paris on November 26th:—

"Two of the three heroes of the recent daring aerial raid upon the Zeppelin factory at Friedrichshafen passed through Paris yesterday proudly wearing the Cross of the Legion of Honour, which the French military authorities, at the instant request of General Joffre himself, conferred upon them in the presence of the garrison of Belfort, the starting point of the heroic exploit. In this way we have the first detailed account of their great adventure, which, apart from the unfortunate accident to Commander Briggs, seems to have been crowned with complete success. Here is the story as the *Figaro* representative narrates it from obviously first-hand information:—

"The raid had a two-fold object, first, to destroy, wholly or partially, the Zeppelin sheds on Lake Constance, and secondly to create a feeling of insecurity throughout Germany. In both respects the enterprise succeeded. It is an open secret that bombs reached their mark, destroying the extremely delicate apparatus indispensable for the construction and repair of Zeppelins, which is, moreover, irreplaceable without long weeks of labour.

"The project, which was kept secret from all save the highest military authorities, was arranged for November 21st, independently of atmospheric conditions, but these, fortunately, were favourable. The start took place at ten minutes past ten on Saturday morning, the three aviators leaving Belfort at five-minute intervals, and in this order—Commander Briggs, Lieutenant Sippe, and Commander Babington. At once they rose to a height of 1,500 yards, made for the Rhine, and followed the course of the river. The three aviators kept within sight of each other as far as Schaffhausen, when Commander Briggs lost his way in the mist, and, bearing to the left, must have reached Friedrichshafen by way of Ludwigshafen.

"Meanwhile Lieut. Sippe and Commander Babington both followed the course of the Rhine independently. As soon as he sighted Lake Constance Lieut. Sippe descended and flew so low that his machine almost grazed the roofs of the buildings, his object being to conceal his presence and the direction of his flight. Reaching the lake he flew lower still, and came within a couple of yards of the water, cleverly using the surface mist as cover.

"Striking straight across the lake he flew beyond Friedrichshafen, turned, and rose rapidly. Then it was that he saw Commander Briggs was already at work, his attention being first directed to his companion by the bursting of fourteen or fifteen shells at a height of a thousand yards, obviously aimed from the ground by the enemy's defensive artillery.

"When within a kilometre of the objective Lieut. Sippe, according to the prearranged plan, swooped down till within 200 yards of the hangars, then suddenly rose again and, amid a hail of shells, and rifle bullets, dropped his bombs, first on the hangar and afterwards on the machine sheds.

"In the workshop yards Lieut. Sippe could see men running to and fro panic-stricken. He and Commander Babington completed the work of panic and destruction that Commander Briggs had begun. Eleven bombs in all were thrown.

"Their mission concluded, all three aviators then returned towards France, and in 3 hrs. 50 mins. afterwards Lieut. Sippe landed at the very point whence he had started. Commander Babington went astray in the mist, and came down 15 miles further on. Commander Briggs was missing. Later it was learned that the leader of the party had been compelled to land on hostile soil owing to injury to his machine. On landing he was attacked by a number of soldiers, seven of whom he shot with his revolver. As their captain approached Commander Briggs covered him with his revolver and shouted, 'Another step and you are a dead man.' The officer replied, 'Surrender and your life will be spared.'

Commander Briggs dropped his arm, and handed his revolver butt foremost to the German officer, who, observing that its chambers were empty and that he had been tricked, struck the English officer across the face with his cane, drawing blood from his forehead.

"Immediately on returning Commander Babington and Lieutenant Sippe reported to the French Staff, who informed General Joffre, by whom in turn the report was transmitted to the British Government."

The Legion of Honour Crosses were pinned on the breasts of Flight-Commander Babington and Flight-Lieut. Sippe by the Governor of Belfort at a review held on the morning of the 23rd. It is stated that the Cross of the Legion of Honour has also been awarded to Squadron-Commander Briggs.

Writing from Romanshorn to the *Daily Chronicle* regarding the Friedrichshafen raid, Mr. Alan Bott said:—

"If Friedrichshafen were not suffering from an acute attack of aeroplane fright it would be the proudest spot in Germany. . . .

"They do not love journalists in Friedrichshafen. Those who visited it in search of copy about the raid were rounded up and sent back by men with fixed bayonets. One man asked for an explanation and was told: 'Here we class journalists and spies together. Newspaper articles on the airships contributed largely to the raid by the British airmen.'

"'Flugzengfurcht'—aeroplane fright—is widespread on the German side of the lake. Sentinels are now posted night and day all round the shore between Constance and Friedrichshafen, on the look-out for stray aircraft. Even before the raid quick-firing guns and mitrailleuses were kept ready for use on the roofs of the castle, the church, and several houses at Friedrichshafen. Now there are batteries on two or three of the surrounding hills in readiness to bombard British aeroplanes at a second's notice. The roofs of the works are being covered with metal. The top of the gas-house was already thus protected before the raid. If ever a bomb is dropped into this building, which on certain days contains an enormous volume of hydrogen and other gas, the explosion will, indeed, be terrible.

"The new super-Zeppelin, which was ready on the day of the raid, has made its first flight over the lake. There were two in the large shed, and probably one-half completed, which were damaged.

"I am able to add that the bombs (to be dropped from a basket let down to 150 metres below the car) are exceptionally large and are torpedo-shaped. They have what can best be described as a kind of small plane on either side, so that they can, if desired, be made to descend in a regular curve instead of straight down. There is a special apparatus for despatching them.

"The constructors have tried to find a suitable shot-proof substance to cover the envelope, but have not yet been successful. Neither have the experiments with regard to a special light gun to be used with the mitrailleuses on the platforms been brought to a definite issue.

"None of the new Zeppelins are being built in the floating shed, but in the works on shore. The shed on the lake is only used for housing the completed vessels, and for repairs. The airship I saw in it from a rowing boat was one of the old ones that had been damaged in the war, and was being repaired."

A *Morning Post* correspondent telegraphed from Berne on November 27th:—

"Despite German denials, I am in a position to state from trustworthy information that the attack on the Zeppelin shed at Friedrichshafen did injure one Zeppelin.

"Further information from Friedrichshafen says that Commander Briggs, who was made prisoner and taken to hospital, has had his face cut badly, but is in no danger. His aeroplane was hit in the petrol tank by shrapnel, which forced him to descend. The Germans are amazed at the excellent maps found in his possession."

In a message on November 29th the *Morning Post* correspondent said:—

"Since the attack on Friedrichshafen by English aviators the whole shore of Lake Constance and the town of Friedrichshafen are in utter darkness at night save for small coloured lights at the pierheads. "Searchlights are playing continually during the night, and strict orders have been issued to the population that in case of renewed attacks they must go indoors and remain there."

According to the Berne correspondent of the *Journal de Genève*, who stated that he had it from authoritative source:—

"The English aviators who carried out the recent attack on Friedrichshafen so timed their raid that they should arrive over the

Zeppelin sheds between noon and two o'clock, when, as they knew, all the workmen would be absent for their midday meal. This proof of humanitarian respect for non-combatants is highly appreciated in Switzerland."

A Central News message from Berne on Tuesday stated:—

"The British and French Ministers have informed the Federal Council that an inquiry has been ordered concerning the alleged violation of the frontier by airmen operating with the Allies' forces. In the meanwhile the strictest injunctions have been placed upon airmen to respect Swiss neutrality."

The following statement was officially published in Berne on the 2nd inst. :—

"In discussing the alleged violation of Swiss neutrality by English aviators, a section of the Swiss Press has reproduced statements from the South German papers suggesting that the British Minister at Berne, Sir Evelyn Grant-Duff, had infringed Swiss neutrality. It is the fact that at the beginning of November the Minister took a motor trip into the Swiss Rhineland and the Lake Constance district and stopped among other places at Romanshorn. With the permission of the priest he climbed the steeple of the church there, but it has been established that on that day the weather was misty, and it was impossible, at all events, with the naked eye, to see Friedrichshafen and the German shore of the lake."

"It has also been established that none of the three aviators who afterwards took part in the Friedrichshafen raid were with the Minister on his trip, and it may be mentioned that in making a application for the necessary permit he gave the General Staff an exact indication of the plan of his tour. The reports that the Federal Council had asked or intended to ask for the recall of the Minister are without any foundation."

"The following statements which have found publicity in the Press, especially the German papers, are equally untrue: (1) That the Public Prosecutor had been instructed to make a searching inquiry into the matter; (2) that the Federal Council had issued a fresh order as to the measures to be taken against foreign military aviators; (3) that a strict inquiry had been opened as to the responsibility of the officers commanding the troops on the frontier; and (4) that the Federal Government had sent the Imperial German Government an explanatory Note."

A Vienna despatch printed in the *Vossische Zeitung* of November 27th said:—

"Postal communication with the besieged fortress (Przemysl) is maintained by aeroplanes, which bring letters, &c., to the nearest field post-office for transmission. Postcards from Przemysl received by this means in Vienna bear the following message: 'All goes well with us. Have no anxiety.'"

In a message to the *Daily Mail* from Petrograd on the 27th ult., Mr. H. Hamilton Fyfe said:—

"I explained some days ago the difficulties, amounting usually to an impossibility, of using aeroplanes in such a country as the Germans had to traverse. It appears now that the German ignorance of what the Russians were doing was mainly due to the inability of the air scouts to provide the staff with information. Their cavalry was of little use in reconnaissance. According to general testimony of the Russian officers at the front, their generals were accustomed to rely on aeroplanes in the same way as they are in the habit of basing their strategy upon the use of railways. In this case they had the assistance of neither, and suffered accordingly."

In the official French *communiqué* issued on Saturday afternoon there was the following:—

"Towards evening our artillery brought down a German biplane occupied by three aviators. One was killed and the others were taken prisoners."

The following details regarding an incident which occurred on November 18th were published semi-officially in Paris on Saturday:—

"About half-past six o'clock while a sergeant of one of our air squadrons, with an observer, was returning from a reconnaissance he noticed a German aeroplane going in the direction of Amiens. He set out in pursuit, but the speed of his machine being slightly inferior he could not overtake the enemy before the latter reached Amiens."

"The enemy, an Aviatik machine, having made a certain number of evolutions in order to drop bombs on the aerodrome and then on the village of Cailly, was overtaken, and the lieutenant fired about a hundred shots from a machine gun, slightly damaging the machine, but without succeeding in hitting either the pilot or the vital parts of the machine. The Aviatik flew away."

"The sergeant then made for an Albatros, which was likewise flying over Cailly, and prepared to attack it, but the Albatros, with

a desperate manœuvre, made a sudden half-turn and went straight for the sergeant's aeroplane. The sergeant, in order to avoid a collision, turned his machine over to such an extent that the machine gun was thrown from its mounting and fell into the body. By the time the Frenchman had recovered his balance the Albatros had been able to get away."

"At the same time another sergeant, who had just alighted in the aerodrome at Amiens after making a reconnaissance, caught sight of the enemy aeroplanes which were flying over the city. He returned to his Morane, accompanied by a mechanic, and set off in pursuit. He caught up the Aviatik just as it had left Amiens, prevented it from returning to the German lines and chased it as far as the neighbourhood of Montdidier."

"The mechanic fired ten shots with his carbine without managing to bring the Aviatik down. On the other hand, the French aeroplane was struck by three bullets, one of which went through its tank and another through the passenger's seat. The chase was given up for want of ammunition. On his return the mechanic, who had set out hastily without even having time to wrap himself up, had to go to bed, having part of his left hand frost-bitten."

"On the same day at about 10.45 the Morane aeroplane, with a lieutenant and a corporal on board, set out to reconnoitre the defence works of the enemy round Dompierre, when they, too, came across the enemy aeroplane. Both pilot and passenger, though only armed with revolvers, attacked resolutely, but a shot from the German's quickfirer cut one of the stays of the wings of their machine and they had to descend with all speed. It was thanks to the coolness and skill of the pilot that they managed to reach the aerodrome at Amiens without the machine having broken up in the air."

An official note published in Paris on Saturday gave the following details of an exploit, on September 9th, of a squadron of French Dragoons who got cut off at a farm in the German lines:—

"Hearing of a German aviation park between Soissons and Compiegne, the officer in command decided to make an attack at 2.30 a.m. Two troops approached the Germans on foot, and at a distance of 40 metres, opened fire, while a third troop on horseback charged at the gallop. The horsemen were annihilated by a machine gun placed at the head of the convoy of cars, but the two troops on foot dashed to the assault and killed the German machine gun crew. A fierce fusillade ensued, the Germans bravely returning the French fire. Meanwhile, the pioneers of the two troops destroyed the aeroplanes, smashing the motors and oil tanks with pickaxes. Three wagons containing petrol were set on fire and lit up the scene. The central car, which appeared to contain the senior German officer, still remained untouched, however."

"The lieutenant and three men crawled towards it, and, rising to their feet they came face to face with two Germans, one of whom was an officer. The latter fired his Browning pistol point blank, killing the three men and wounding the lieutenant in the arm. The French officer fired back and killed his adversary. The other German knocked down the lieutenant with the butt end of his rifle, but the gallant officer succeeded in crawling away and eventually escaped. Only ten Frenchmen came back of the troops engaged. They lay hidden for three days in the village among the German lines. They were finally released on September 13th by the entry of a victorious division of French infantry."

In a message to the *Daily Mail* from Rotterdam on Sunday evening Mr. James Dunn said:—

"The Allies' aeroplanes have discovered that the German line has been weakened."

"Yesterday five allied warplanes dropped nine bombs on Ghent, doing much damage to the military stores there. Machine and anti-aircraft guns have been placed on the Hallen tower at Bruges as a defence against the British warplanes, the frequent appearance of which drives the soldiers to the shelter of the houses. So far no warplane has been hit."

In a despatch dated Friday Mr. Dunn wrote:—

"During the last two days the allied warplanes have dominated the air. The Germans fear the aeroplanes even more than they fear the bayonet, for every flight is followed by deadly artillery fire, especially from the big British guns, which easily outrange the German artillery with the exception of the guns of position."

Under the heading of "An Unjust Charge" the *Frankfurter Zeitung* printed the following a day or two ago:—

"On November 7th we reproduced from the *Berliner Lokal-Anzeiger* an extract from a war letter, which described how a British flying officer had compelled a captive German soldier, who was naked, to accompany him in order to betray the German positions. The machine, it was added, descended behind the German lines, and the officer was shot. It is gratifying to find, as

the result of a most careful investigation, that this description is at variance with the facts. Rumours and stories about British officers attempting to make use of German prisoners for the purpose of reconnaissance are frequently heard, but up to the present no case has been recorded which in any way corresponds to the statement made in the war letter. We desire to give this correction the same publicity as the notice we took from the Berlin paper no doubt obtained."

The difficulties of the pilots were thus dealt with by a *Times* correspondent in Northern France writing on November 28th:—

"Our airmen have had a hard time in the recent cold spell, encountering at 6,000 ft. 50 degs. of frost. The last daring achievement of the aerial navy has been chronicled, but splendid as it was the work of the reconnaissance men over the firing line has called for equal nerve, skill, and endurance. They are out for long spells under a constant strain, and the wind they meet at the great height at which it is necessary to keep their machines reduces their speed and makes them an easier mark for the enemy's anti-aircraft guns. One of our aeroplanes came down the other day pitted with 60 bullet marks. Thanks to the bullet-proof seat the pilot was not hit."

"The German air navy has not shown the same high qualities of courage and enterprise as have been exhibited in their army and fleet—or such is the impression of British airmen who have been right through the war. There was the extreme case lately in which one of their airmen came to ground with his machine untouched, out of sheer loss of nerve. One of the enemy's aeroplanes was brought down early in the week among the Indian troops. It came to earth well behind the supports, and the men ran up to examine it. They were surprised at the size of the machine, having always thought of it as a kind of huge insect. And they were a little relieved to discover its fallibility."

Writing from Amsterdam on November 28th a *Morning Post* correspondent said:—

"My correspondent at Yzendeijke telegraphed to me that on Friday afternoon two airmen appeared over Ghent, dropping a bomb, which wounded some civilians."

Describing a successful surprise attack on a German position a *Daily Chronicle* correspondent telegraphed on November 29th:—

"French artillery got the range and landed a few dozen shells into a clump of trees to the left of the enemy's position. This clump had been used as cover for a kind of motor park, and information to this effect was brought in by an airman who had seen cars going in and out frequently. Apparently a good number of cars were destroyed, for after a few shells had been dropped into the wood a series of explosions were heard, and the whole place seemed to be blazing."

A message from Reuter's correspondent at Luderitzbucht, dated November 29th, said:—

"A German aeroplane to-day delivered its first attack on our forces at one of the advance camps, where the railway was blown up last month by the retreating Germans and is now being repaired. Two 18-lb. shells were dropped, the objective evidently being a locomotive. The bomb which dropped nearest fell about 210 yds. away, but no damage was done. The machine flew fairly low at a great speed."

* * *

Another Suggested Industrial Army Badge.

THE annexed sketch has been sent to us by Aviation Accessories Co., of 17, Old Broad Street, of a badge



which the Company are issuing, which, as an unofficial "button," in a measure fulfils the suggestion dealt with at length in *FLIGHT* last week. This particular badge is

In a semi-official statement issued in Paris on November 30th, in the section dealing with the fighting from the Lys to the Oise, there was the following:—

"On the 25th, after aeroplane scouting, we destroyed two quickfirers."

Writing to the *Daily Mail* from the North of France on Monday Mr. Basil Clarke thus described an aerial reconnaissance by French aviators:—

"A French monoplane and a biplane flying high passed over to locate the new positions of the German batteries. The German gunners know all the tricks of their craft in hiding guns from enterprising airmen. Gun-barrels may be coated with straw or grass sods and put on a carpet of straw or grass; guns may be hidden in barns or cattle shelters or covered over with little pent-houses made of wooden frames packed with hay so that from above the gun shelter looks like a harmless haystack. The enemy have been known to put guns in cottages and even in the ruins of churches."

"But the Allies' airmen, too, are not without knowledge of their task. It was soon after daylight when they left their hangars and set off eastwards. The bells were tinkling and the villagers were making for church when the airmen were seen returning. The new positions of the Germans guns had been carefully charted."

The *Daily Telegraph* correspondent wired from Copenhagen on Monday:—

"A German hydro-aeroplane, numbered Kiel 82, has fallen into the sea to the south of Fanoe, Jutland, during a fearful storm. On board was an officer named Psurdode and his mechanic. Both, who were only slightly wounded, have been interned and are guarded by soldiers at Sonderho. Examined by a Danish officer, they said they left Kiel in the morning, flying over Heligoland along the west coast of Sleswig. The storm, however, was too powerful for them."

A *Daily Mail* correspondent at Copenhagen reported on Tuesday:—

"Several thousand mechanics and artisans have been withdrawn from the army with a view to speeding up the construction of submarines, waterplanes, and special craft to be used as jumping-off places for airships."

"In well-informed quarters it is stated that the Admiralty regard the British preponderance in Dreadnoughts as hopeless unless a great German force of submarines and aircraft first launches an attack on the British battle fleet. The boast is made that the Germans possess submarines and aircraft which can easily blow up British Dreadnoughts."

A Central News message from Amsterdam dated Tuesday said:—

"From Terneuzen it is reported that on Friday British airmen dropped bombs near the outer port of Zeebrugge. Two did not explode, and one fell into the water. Two workmen were slightly injured, and some material damage was caused. This was evidently an attempt to destroy the oil tanks, but they were not struck. The Germans fired at the airmen, who escaped."

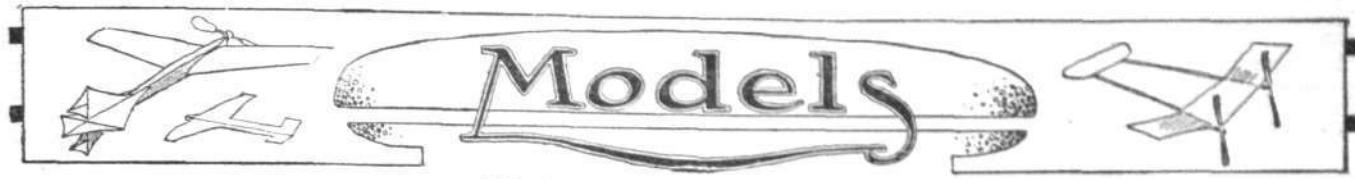
Another message from the Hague, stated that British aviators passed over Ghent on Monday and dropped bombs on the military quarters, several German soldiers being injured.

* * *

worked out in gilt metal and blue enamel, and can be obtained by any firms for their employees, but not by the individual employees themselves. The name of the firm itself can be, under arrangement, substituted for the word "Aviation." This of course would be a temporary solution to the wearing of a badge of this character, but what we particularly want to see carried out is an official badge issued by the authorities themselves to the firms, when Aviation Accessories should come in for consideration in getting the approved design manufactured.

Imperial Honour for Japanese Society.

THE Japanese Imperial Aero Society, which has Premier Count Okuma for President, and Baron Mayor Sakatani for Vice-President, has been honoured with the acceptance by His Imperial Highness Prince Kuni of the office of Honorary President.

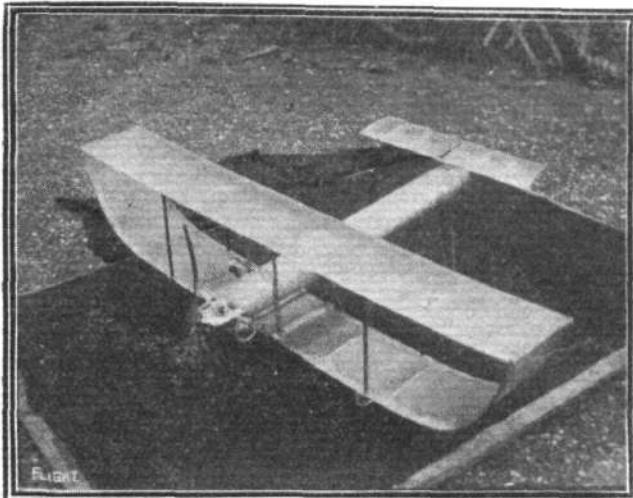


Models

Edited by V. E. JOHNSON, M.A.

Models Driven by Compressed Air. The Bragg-Smith Biplane.

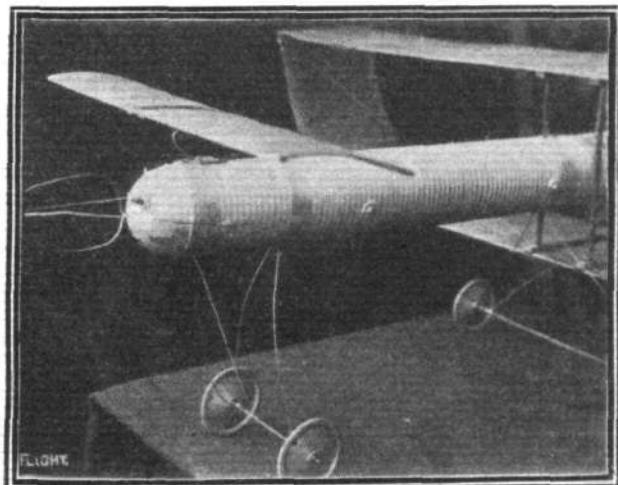
We give this week some illustrations and particulars of a model just completed by Mr. G. P. Bragg-Smith. The model consists of a compressed-air plant, as sold by Messrs. A. W. Gamage, fitted to a Bragg-Smith type of model, including a propeller of new and original design. As our readers can see, the machine presents quite a good appearance, which is more than can be said for similar



Mr. G. P. Bragg-Smith's compressed air-driven biplane model.

machines of foreign manufacture; in fact, this particular type of biplane seems to suit the long and rather stout container extremely well.

General Particulars.—The total weight of the machine is just under 1 lb. 13 oz., and the loading works out at nearly 7.5 oz. per sq. ft. The diameter of the container is 3 ins., its length 25 ins. (cylindrical) with hemispherical ends, radius 1.5 in. The container



Mr. G. P. BRAGG-SMITH'S COMPRESSED AIR-DRIVEN BIPLANE MODEL.—On the left, view from the front showing steel wire protector, elevator, chassis, wire-bound container, and pumping-up valve (in front), and on the right a view of the engine and pressure gauge.

is constructed of very thin sheet brass wound with steel piano wire, as Fig. 3 clearly shows. This latter adds enormously to its strength; and the hemispherical ends, whilst decreasing the air resistance, are of the form to give maximum strength.

The height of the bottom of the propeller from the ground is 8 ins. The wheels are of the disc type, rubber tyred, two in front and two behind; their diameter is 2.75 ins. The wheel base in front is 5.75 ins., and behind 14.5 ins. The distance between the leading edge of the top main plane and the rear edge of the elevator

is 15 ins. The centre of gravity of the machine is situated about an inch in front of the main plane. The dimensions of the elevator are (mean): Span 8.5 ins., and chord 4 ins. The dimensions of the top main plane are: Span 46 ins., chord 6.5 ins. The height of the bottom of the lower main plane from the ground is 5.75 ins.

The propeller, of moderate pitch, is laminated, the ends are silk bound, it is of somewhat unusual strength, and has a diameter of 15.25 ins.

The chassis struts are of stout steel wire, and the wheel axles of steel umbrella ribbing. The length of the engine pistons is about 1 in., and their outside diameter $\frac{1}{2}$ in.; the stroke is about $\frac{1}{2}$ in., the engine being so boxed up the latter cannot easily be measured. The three cylinders are symmetrically arranged on a 1-in. circle 120° apart.

The engine is apparently constructed of light brass and soft soldered. The tap is of the ordinary cone-shaped pattern, a turn through 90° turning it full on. The manner in which the engine can be throttled down is rather remarkable.

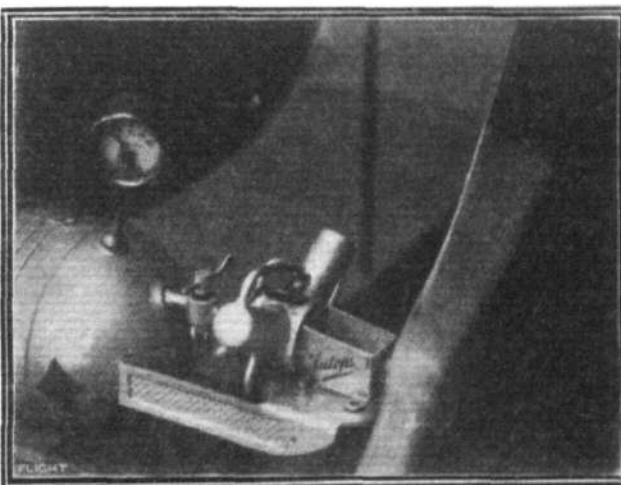
Experiments and Tests.—On the writer expressing his desire to the builder of the model that he would like to carry out, in conjunction with him, some tests with the machine, Mr. Bragg-Smith at once expressed his willingness to do so; and certain tests and experiments were arranged which I am about to relate.

The flying tests were carried out first and the laboratory tests afterwards; in narrating them, however, I will deal with the latter first. In the issue of FLIGHT of May 29th, 1914, p. 583, the writer related some experiments that he had made with steam plants, and drew certain conclusions from them. Some of these conclusions seemed somewhat ridiculous, and as a matter of fact were ridiculed in more than one quarter; nevertheless they were not far, if at all, out, as the following facts will show.

The following was one of flying tests gone through in a salubrious neighbourhood known as Figg's Marsh. I am not acquainted with the orthography of the gentleman's name, but I insert two "g's" on the off-chance; this particular plot of ground is appropriately named, so far as the marsh is concerned, on the day in question at any rate.

The container was given 50 pump strokes, and the model was hand launched; it flew quite well for about 50 yards and then glided to the ground.

Now one of the laboratory tests consisted in fitting a small pressure gauge (clearly shown in the illustrations) to the container and



carefully comparing a specified number of pump strokes with the lbs. pressure per sq. inch as recorded by the gauge.

No. of pump strokes.	lbs. pressure per sq. in. in container.	No. of pump strokes.	lbs. pressure per sq. in. in container.
25	25	120	110
50	50	130	112-115
75	70	150	122 approx.
100	90		

Generally speaking, the same number of pump strokes gave exactly the same number of lbs. pressure, thereby showing there was practically no pump leakage.

Now in the above table 50 pump strokes give a pressure of 50 lbs. per sq. in., but with 50 pump strokes the model was capable of free flight, therefore a pressure of 50 lbs. per sq. in. is sufficient to maintain an efficient model and power plant in free flight.

This conclusion is, I think, a most important one, and, so far as I know, it is the first time that it has been demonstrated experimentally. I might perhaps add, although it should scarcely be necessary, that all the experiments were made with the greatest care and can be thoroughly relied on; moreover, the conclusions have been carefully kept on the right side. Conversely to the above conclusion, since the above model was capable of flying with a 50 lb. pressure, whilst carrying a load per sq. ft. of 7.5 oz., it clearly demonstrates that the model is in every respect an efficient one, i.e., it has an efficient general design, efficient planes (although we have heard much criticism in the past as to why in the Bragg-Smith model the trailing edge is practically as thick as the front), efficient air resistance, efficient propeller, and last, but not least, an efficient engine—efficient, that is, for the purpose for which it is intended. You can drive the engine and propeller round by blowing in the container, it runs so easily, but loss of efficiency owing to wasted air (at high pressure) is more than compensated for by consequent loss of friction, which, as I have stated before, in small models can easily amount to more than 50 per cent.

The above tests were not carried out to higher pressures because we all know very high pressures will fly any type of model. My desire was to find out what lower pressures, if efficiently applied, are capable of.

In conjunction with the above tests, and in their way as a verification of them, the following experiments on the static thrust given by the propeller at certain pressures were made. The results given are the mean of a number of experiments. Friction was eliminated by placing the machine on a slight incline, until it did just not run down. The pull was taken not by means of a spring balance, which is liable to error in some cases, but by means of a fine thread running over a freely moving pulley and a vertical lifted weight. Practically speaking, the same pressures invariably gave the same results, the differences being quite minute and due mainly in all probability to the wheels not being perfectly round and the surface not perfectly level, the latter being a thin sheet of (tinned) iron. When 50 strokes of the pump (i.e., a pressure of 50 lbs. per sq. in.) was put into the container, the propeller gave a static thrust of 8 ozs.—a thrust, be it noted, well sufficient to maintain an efficient machine of 1 lb. 13 ozs. (the complete weight of the model) in flight. In another experiment, when the pressure was 60 lbs., the propeller thrust was over 10 ozs., this particular weight being raised freely.

At 110 lbs. pressure, i.e., 130 pump strokes, the thrust was over 1 lb., a 1-lb. weight being raised easily and maintained raised for some time.

In these and other experiments of a similar nature, the weight was well lifted several inches or more; no undecisive result was taken. It is worth noting that whereas a 60 lbs. pressure produces a 10 oz. thrust, a pressure of 110 lbs. only produces one of 16 ozs.

In other words, high pressures are not so efficient with this type of motor.

From the foregoing we see that an initial pressure of 75 to 80 lbs. would be ample even for an r.o.g. model, especially if means could be devised to maintain that pressure, or a pressure not falling below that of 60 lb. per sq. in.

This can be done if the compressed air be heated in its passage from the container to the engine.

At the present moment it is also superfluous to speak of the deadly efficiency of the torpedo. Now, the torpedo is driven by compressed air, and some of the best modern torpedoes are said to be capable of no less a speed than 43 knots, and have a range of over 1,000 yds. The Whitehead torpedo carries two propellers running in opposite directions in close proximity on concentric shafts; that is to say, one shaft is tubular and the other (which passes through it) is solid.

One of the latest improvements has been the heating of the compressed air with which they are driven, thereby increasing both their speed and range. This can at once be seen from the following considerations. Let us suppose that we are using air contained in steel cylinders capable of withstanding a pressure of 300 to 600 lbs. per sq. in., i.e., 20 to 40 atmospheres.

This is quite ordinary, for steel cylinders can be obtained containing air compressed to the enormous pressure of 120 atmospheres—practically liquid air—and even so high a pressure as 250 atmospheres has been used. The most economical way of using highly compressed air is to admit it direct from the reservoir to the motor cylinders; but this means an enormous range in the initial working pressure, entailing not-to-be-thought-of compound engines, variable expansion gear, &c. We have therefore to relinquish the

advantages of our high initial pressure and pass the air through some form of reducing valve, whereby an approximately constant pressure of, say, some 150 lbs. per sq. in. is maintained. By a variation in the ratio of expansion the air can be worked down to considerably lower than this if desired.

Now the initial loss entailed by the use of a reducing valve may be counteracted in a great measure by heating the air before using it in the motor cylinders. By heating it only to a temperature of 320° F., the volume of the air is increased by one half and the consumption is reduced in the same proportion, i.e., the air would last twice as long and the range of the torpedo would be doubled.

Therefore what has already been done in the case of the torpedo now requires to be done in the case of model aeroplanes driven by the same power. Leaving the practical consideration of this question for a moment, let us return to the flying tests. The day was unfavourable, a heavy atmosphere and a raw and then puffy wind, condition of ground very wet, soft, and uneven grass, nevertheless when the model had been correctly adjusted (after several very vigorous rams at mother earth which in no way damaged the machine) it never failed to rise off the ground when travelling with the wind, and several quite good and steady flights were made.

With the 110 lbs. pressure the model is capable of rising off decent ground and making a good half minute's flight, and with the container more pumped up, i.e., up to 120 to 130 lbs., a duration of three-quarters of a minute can be obtained. The instructions with the container are that it is not to be charged beyond 150 lbs., which should give about a minute's flight; up to now it has not, however, been tested up to this. The minimum temperature in which it should be flown is 55°, another reason for heating the air.

The writer is at present constructing a similarly designed plant out of some very light scrap material he has by him, and whatever the results full particulars will be given later. In our next issue a full explanation with sketches will be given of how the very ingenious and simple little motor works, together with the commencement of a series of articles on how to construct this type of plant, in which the heating question will be fully dealt with.

(To be continued.)

The Paddington Club and Research Work.

We have just received the following very interesting and encouraging communication from Mr. W. E. Evans (Hon. Sec., Paddington and District Aero Club), to which we will refer again in our next issue:—

“ Several members of our club are about to take up research work in connection with rubber-driven models, and I should be glad if you could suggest what lines might be followed with advantage. One subject which is sure to be taken up is that of propellers, testing by means of duration the relative efficiencies of large diameter and small pitch as against small diameter and large pitch; also whether wide or narrow blades are better in a model designed for slow speed. Another point requiring investigation is the ratio of camber to the chord of a main plane; also the best angle of incidence for main plane, with corresponding angle for elevator or tail.

“ Should the weight of rubber be governed by the total weight of the model? Should the propeller disc area have any specific relation to the weight of the model? Given an equal rotational speed, does the thrust vary as the disc area? If any of these problems have been settled many aeromodellists would greatly appreciate the information concerning the results arrived at. If a discussion could be opened in the columns of the model section of FLIGHT, perhaps some of these questions could be elucidated by the leading aeromodellists.

“ Four of our members are constructing compressed air models, but at present these will not be far enough advanced for purposes of research work. We want reliable models for this purpose, and only those rubber-driven which are capable of doing, say, 60 secs. duration repeatedly will be employed for this work. It seems practically certain that rubber-driven models will be discarded by the best model flyers next season, which will give a much-needed prestige to model aeronautics in the future.

“ I also seek your advice concerning a wind tunnel which I propose to construct. I can obtain the necessary power to drive a 2 ft. 6 in. or 3 ft. propeller to create the necessary current of air. How can I best measure the air speed in the tunnel? Would an anemometer be indispensable for this, or are there any other means by which it could be measured or calculated? Could you give me any information as to how a balancing arm could be constructed, and what would be the simplest method of measuring, say, the lift and drag of an aerofoil?

“ Any information or advice concerning the above points would be greatly esteemed by the writer.”

KITE AND MODEL AEROPLANE ASSOCIATION.

Official Notices.

British Model Records.

Single screw, hand-launched	Duration	...	J. E. Louch	...	95 secs.		
Twin screw, do.	...	{	Distance	...	R. Lucas	...	590 yards.
			Duration	...	T. D. Collingwood	...	
				Chown	...	145 secs.	
Single screw, rise off ground	Distance	...	W. E. Evans	...	290 yards.		
	Duration	...	J. E. Louch	...	68 secs.		
Twin screw, do.	...	{	Distance	...	L. H. Slatter	...	365 yards.
			Duration	...	J. E. Louch	...	2 mins. 40 secs.
Single-tractor screw, hand-launched	Distance	...	C. C. Dutton	...	266 yards.		
	Duration	...	J. E. Louch	...	91 secs.
Do., off-ground	Distance	...	C. C. Dutton	...	190 yards.		
	Duration	...	J. E. Louch	...	94 secs.
Single screw hydro., off-water	Duration	...	L. H. Slatter	...	35 secs.		
Single-tractor, do., do.	Duration	...	C. C. Dutton	...	29 secs.		
Twin screw, do., do.	Duration	...	S. C. Hersom	...	65 secs.		
Engine driven off grass	Duration	...	D. Stanger	...	51 secs.		

Official Notices.—Trials to break official records will be made at the Aero-Model Association Practice Ground, Bishop's Avenue, East Finchley, N. on Saturday, the 12th prox. These trials will be taken by Mr. A. F. Houlberg.

All communications to be addressed to Mr. H. A. Lyche, 95, East Sheen Avenue, East Sheen, S.W.

AFFILIATED MODEL CLUBS DIARY AND REPORTS.

Club reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Aero-Models Assoc. (441, HOLLOWAY ROAD, N.

THERE is to be a social meeting on Dec. 4th, at "The Cabin," near East Finchley Station; while, on the 12th, the K. and M.A.A. are officially observing some record trials on the club's ground.

Monthly Report.—The third day of October saw the final round of the contest for the Farrow Shield, in the wilds of Wimbledon. After scraping ahead of their opponents, the Leytonstone and District Aero Club, by some 20 secs., the Association's team were disqualified, owing to one of the machines being over-surfaced. Messrs. Brookes, Claffin, McBinnie (too much surface), Partridge, Root and Weston constituted the team, and—well, we got into the final anyway. The competition for the Enfield Cup was held on Oct. 31st. This contest, the event of the season, was responsible, as usual, for some brilliant flying, though, owing to the gusty wind which prevailed, flights of a lengthy duration were impossible. Seven members competed. The indefatigable Mr. Hindsley, who, by the way, has now left town for service with the R.N.A.S., with a hollow-spar 1-1-0-P2 model (length 48 ins., span 42 ins., weight 8 ozs.), won. His average was a matter of 66 secs., only topping Mr. Claffin's time by a mere fraction of a second. The latter competitor's time was 65½ secs., while Mr. McBinnie was third with 60½ secs. The ding-dong struggle of the three placed machines as the evening was drawing in is to be long remembered. Messrs. Weston (disabled early in the contest), Brookes (luck out), Coleman and Root also competed. The coming of the winter has not interfered with the usual week-end flying at Finchley during the last two months, for a detailed report of it would fill a whole journal.

Leytonstone and District Ae.C. (14, LEYTONSTONE RD., STRATFORD)

Monthly Report.—Month's competition, twin screw tractor was won by J. Louch. A. Wharmby and H. H. Bedford, Junior, single screw, was won by W. Scott, all silver medals. Will all members meet at clubroom at 10 o'clock prompt on Sunday mornings? Flying as usual.

Paddington and Districts (77, SWINDEBY ROAD, WEMBLEY).

DEC. 5TH., monthly competition. Twin propeller r.o.g. models. First prize value 5s., second prize, materials value 2s. 6d. Dec. 12th, first winter general meeting. Members meet at secretary's house, 6 p.m. Discussion on club research work.

Monthly Report.—The monthly competition was held on Nov. 7th, the models being single propeller r.o.g. The silver medal was won by D. Driver with an average of 50½ secs. W. E. Evans was second with 36½ secs. Messrs. J. R. Barrett, T. Carter, and H. Woolley also competed. Mr. R. Bird has devoted his whole attention to compressed-air models with fair success. His first model, a canard monoplane, has been abandoned for one of the tractor type, which flies steadier. With a moderate pressure in the container flights of about 20 secs. have been obtained. Several other members are now working diligently on compressed-air models—namely, Messrs. T. Carter, H. Woolley, and W. E. Evans. The former has constructed a very neat light-weight twin opposed cylinder engine, whilst H. Woolley has made a vertical twin cylinder engine. W. E. Evans is using Mr. M. H. Canning's CO₂ 5-cylinder rotary engine for compressed-air, with which it runs well. An extra large container has been made for it. The complete model will be similar to the latest Wright, twin pusher biplane with tail. Mr. C. C. Dutton is designing an engine for a compressed-air model, so it appears that rubber-driven models will be relegated into second place in this club next season. Mr. A. Rasmussen has just introduced a twin-screw tractor, which will be put through its trials as soon as weather permits. The committee have for some weeks past had under consideration research work by means of models, and have now formulated a scheme, which will be introduced to the members at the meeting on Dec. 12th, whereby each member willing to undertake this work will have a particular object in view. Forms for recording particulars of models, modifications of same, and results of flights will be provided for this purpose. It is hoped by these means to acquire more certain and useful information than from the mere sport of model flying. A list compiled by Mr. A. Rasmussen, showing the specific gravity and weights of metals and other substances will be found useful in model construction by the members. Copies of this will be distributed at an early date.

South-Western Aero Club (373, BRIXTON ROAD, S.W.).

DEC. 12TH, Target Competition at Brockwell Park, for the club's prize, and a special prize given by Mr. F. Miller.

Monthly Report.—Mr. R. Bell and Mr. D. Prodger have joined the Royal Naval Air Service. The R.O.G. Tractor Competition attracted 10 entrants, but the weather conditions were anything but favourable. The winners of the three useful prizes given by Mrs. Prodger were: 1st, P. W. Peel, 48 marks; 2nd, Mr. S. Smith, 43 marks; and 3rd, G. Norchi, 41 marks. The winner's model was a twin tractor. Length of A frame fuselage, 4 ft.; wing, double surfaced; span, 3 ft. 6 ins.; chord, 6 ins.; elliptical tail; span, 18 ins.; chord, 5 ins.; twin-pro-



Some members of the South-Western Aero Club at work.—From left to right, Mr. P. W. Peel (Hon. Sec.), R. Bell and D. Prodger. The latter two are now serving in the Royal Naval Air Service.

ellers, each 14 ins. diam., driven by 10 strands ½ strip rubber. This model had a fin over the main plane as well as over the tail, but the weather being so unfavourable the model was not tuned up properly, and the effect of the fins could not be noticed. Mr. S. Smith's model, except the wing, was the same as described in last month's report. Mr. G. Norchi's model followed very closely the lines of the "Gnat" tractor. Mr. M. Prodger and Mr. Clark had the misfortune to smash their very promising models prior to the competition. The members are devoting their attention to covered-in fuselage models. Models in course of construction are: Mr. G. Norchi, enclosed fuselage tractor; Mr. Osborne, enclosed fuselage tractor; and Mr. J. Reid, triple gear tractor biplane. A very interesting paper was read before the club on Saturday, 28th, by Mr. S. Smith, on the "Construction of Model Propellers," detailing the actual experiences of this member. Two new members have been enrolled this month.

Stony Stratford and District Kite and Model Ae.C. (OLD STRATFORD).

PROGRAMME for December: Members' monthly meeting, Clubroom, Wednesday, Dec. 2nd; important business to transact. Members' monthly competition, Saturday, Dec. 19th, to commence at 2.30 p.m., owing to it being dark at 5 p.m. Flying every Saturday, weather permitting, at Old Stratford. Local gentlemen interested are invited to pay us a visit.

Monthly Report.—First members' monthly meeting of the fourth season was held on Nov. 4th at the club-room, the subject of "Weight Saving" being introduced by the secretary, and a very animated discussion followed. A summary report and balance sheet was presented and adopted. Officers for current year were nominated. President, Mr. J. J. Atkinson, C.C., F.R.A.S.; vice-presidents, Major Hawkins, Major Hooker, and Rev. S. Cheshire; chairman, Mr. E. Brown; vice-chairman, Mr. H. Mennell; committee, Messrs. W. Palmer (branch secretary), Cherry, V. Peer, and H. Neave; assistant secretary, R. W. Elmes; hon. secretary and treasurer, O. Hamilton, jun. Observers for K. and M.A.A. were nominated as follows: Rev. S. Cheshire, O. Hamilton, sen., R. W. Elmes, and O. Hamilton, jun. It was unanimously resolved to again affiliate in 1915 to the K. and M.A.A. Several rules were altered, and it was decided as far as it was possible to retain the monthly competitions. In order to encourage the introduction of the single-spar twin, the secretary has offered a special prize for the first member to obtain 60 secs. Oct. 31st, Nov. 7th and 14th, have all seen consistent flying, Mr. Mennell getting 45-50 secs. regularly with single; K. Woollard, a new junior member, 22 secs. with single; O. Hamilton, jun., out testing single-spar twin, but not enough surface. Nov. 21st, members' monthly competition. Conditions were far from perfect, the air was thick with moisture, and it was hardly possible to get anything to lift. The event was for singles, and drew 7 entries. The results: Mr. Mennell, 1st, 31.5 marks; Mr. Mennell, 2nd, 30.5 marks; Mr. J. Clarke, 3rd, 26.6—Mr. Mennell, best only, being 32 secs. and 207 yards 2 ft., and he never usually leaves the field before doing 45-50 secs., which he obtained after the weather cleared a little. Mr. O. Hamilton, jun., had bad luck, for after tuning his 4 ft. single he re-covered plane and used a gum, which was not moisture proof, and had the misfortune to see his plane strip in flight. We are glad to be able to report that a number of the special prizes we received last season have been renewed. We are also able to report that we have signed some fresh names on to help make up the deficiency, temporary, due to the war.

Windsor Model and Gliding Club (10, ALMA ROAD).

Monthly Report.—Although there is nothing of outstanding importance to report this month, this does not mean that the work has not progressed. On the contrary, quite a steady advance has been made, especially when the fact is noted that no less than six of the members have enlisted, while four others are serving their country in the construction of aircraft. Mr. Pettit has sailed for India, so that the great benefit of his skill in the making of fittings will be missed. The greater part of the work on the biplane is now being done by Messrs. F. Camm and S. Spicer, who are to be commended for their perseverance. A set of drawings and description will, we hope, be published in next month's report, so that any mention of the machine will have to be left till then. The following are the members who have enlisted: Messrs. E. Stanbrook, S. Dandridge, G. Pettit, S. Barton, A. Domoney, and A. Eldridge. The last-named has been in His Majesty's service for a year. With regard to models, the only thing of interest is the compressed-air model being built by Messrs. J. and W. Rogers. It is of the canard monoplane type, and is well up to the standard usually associated with these enthusiastic workers. A detailed account will be given when the model makes its first appearance. Mr. E. Stanbrook is determined not to give up model-flying, and does quite a lot at camp. It is to be hoped the members, who are now so scattered, will soon be working together again.

Wimbledon and District (165, HOLLAND ROAD, W.).

DEC. 5TH and 6TH, flying as usual.

Monthly Report.—Compressed-air driven models. A great deal of flying has

been done with these during the past month, though some trouble has been experienced owing to freezing up on cold days. Two new machines made their appearance on the 7th, Messrs. Jannaway's and Chown's tractor monoplanes, of 6 ft. and 6 ft. 6 ins. span respectively. Mr. Jannaway made some short flights, but it was found that alterations would be necessary to the *cabane*, as it was too low to give sufficient angle to the stay wires. Mr. Chown's mono. made several flights, but the screw with which it was fitted proved to be too flexible: on the 14th, fitted with a new screw, several good flights were made, the best duration being 29 secs. Mr. Tucker's Avro has flown each week, doing very fast flights and climbing well. Mr. Laing and Mr. Boniface have flown their monos. regularly, averaging 30 secs.; on the 14th, these machines made several flights of 40-45 secs., getting up to over 80 ft. high. The sensation of the month was provided by Mr. Hayden's tractor mono., which on the 1st made a magnificent flight of 74 secs., a club record for compressed-air models. A faster screw has now been fitted for flying in windy weather, and with this the machine has made numerous flights of 50-60 secs. Mr. Hayden is now constructing a tractor biplane of novel design; one feature will be the containing of the tank within a built-up covered-in *fuselage*. Rubber-driven models: Very little has been done with these models, but it is probable that during the winter more time will be devoted to them, as they are unaffected by the cold, and provide more exercise for the flyer. Mr. W. G. Smith has flown his 3-oz. twin, getting 80's. Mr. Powell also has flown his 3-oz'er, getting 80-100 secs. Messrs. Hayden and Chown have flown small single-screw canards, and Mr. Hayden has also had out his 5½ oz. tractor, which he intends to tune up for an attack on the tractor duration records.

UNAFFILIATED CLUBS.

Bedford and District Model A.C. (22, PARK AVENUE, BEDFORD).

Monthly Report.—Not much outdoor work has taken place since the last report was published in FLIGHT. Members having either spent their time in constructing new models, or in doing "recruit drill"! One or two events are, however, of interest. On Nov. 10th, the club held its first exhibition, as an ending up to the season. It was held on the club's ground—the Polo ground on Ampthill Road. Models were exhibited by all the members, and included scale models, hollow spars, A-frames, floating tails, tractor biplanes and monoplanes, and accessories. Mr. Grimmer exhibited his two monoplanes, a 25 h.p. Anzani-Bleriot, and a 35 h.p. Deperdussin. It was on the latter machine that Brock and Whitehouse put up such fine flights last year at Hendon. Some fine model flying demonstrations were given by Mr. H. A. Bryant with his twin-propeller, hollow-spar, floating tail monoplane, which rose off the rough grass in fine style, doing wide circuits of about 35 secs. duration. The exhibition was visited by a great many spectators, amongst whom it was noticed were several men of the Highland Division quartered in Bedford. From a pecuniary point of view the exhibition was a great success, and the workmanship of the models was distinctly above the average. Just before dusk, Mr. Grimmer made a pretty little flight in the Dep., though after having landed he turned the machine very sharply when "taxying" back to the hangar and wrenched off the tyre of one of his wheels, which unfortunately, brought the proceedings to an end. On Nov. 14th, Mr. R. Blin Desbreds (the aeronautical lecturer to the Polytechnic, London, and to the R.M.A., Woolwich), gave us a very interesting illustrated lecture entitled "Aircraft in Peace and War." The lecture was thoroughly enjoyed by all the members and their friends who were present, his slides being particularly good, many of them having been taken since the beginning of the war. The list of members serving with the Colours is, for a small club, quite a formidable one, and is headed by our popular President, Mr. Claude Grahame-White, who has taken such a keen interest in the Club since it was started. List of members of the Bedford Aero Club serving with the Colours:—Flight-Commander Claude Grahame-White, President, R.N. Air Service; Second Lieut. D. G. M. Robinson, 4th South Staffs Regiment; C. F. M. Chambers, Royal Flying Corps; C. L. Matson and W. E. F. Clarke, D. Co. second Public Schools Batt. Royal Fusiliers; G. H. D. Adams, East Anglian Royal Engineers; R. Simpson, W. R. Bowick, D. Anderson, C. Booker, and T. S. Williams, Bedford Officers' Training Corps; H. A. Bryant and E. C. Clark, Special Scouts for guarding bridges, &c., at night.

Burton and District Aero Club. (156, SHOBNALL ROAD.)

Monthly Report.—No flying has been done this month by the members, as all have been busy helping to get the workroom finished. A generous supporter in the person of Mr. T. Caldwell has joined the club, and provided us with a complete stock of materials for model building, for which we are very grateful. New members welcomed.

Finsbury Park and District (66, ELFORT ROAD, HIGBURY, N.).

DEC. 5TH, duration and distance contests, 3.30 p.m. (postponed from Nov. 28th).

Monthly Report.—The past month has been fairly uneventful, but flying has been indulged in by nearly all the remaining members. Mr. F. E. Raynor, who holds the club twin-screw record, has been flying his small h.l. canard, reaching 49 secs., while Messrs. G. Wren and B. H. Barnard have got well into the "forties" with r.o.g. Morane tractors. Mr. H. Mullin brought out a square wing tractor of high aspect ratio, and a larger fin than usual; it proved itself a slow flyer, and with an alarming tendency to spin. A. Richards has been flying Deperdussin tractor and twin-gear h.p. tractor, the former getting above 50 secs., but the latter was evidently hampered by excessive torque of the propeller, and did not greatly distinguish itself. Messrs. H. Mullin and B. H. Barnard brought out waterplanes on Nov. 14th, and these put up some interesting performances on Highbury Ponds; no flights were timed, however, although many were made. Mr. H. Savage has also been flying his tractor Antoinette mono. very well.

Liverpool Aero Research Club (62, CEDAR GROVE, LIVERPOOL).

DEC. 5TH, "Aero Research Trophy" Competition, 3rd quarter, 3.30 prompt, Clubmoor.

Monthly Report.—This month all meetings were held at Clubmoor ground, this having been chosen as the club's winter quarters. Oct. 31st, B. Tear, with large covered-in *fuselage* mono., G. H. Kilshaw h.l. back curved mono. and r.o.g. covered-in *fuselage* canard mono., T. W. Bennett getting some fine flights with r.o.g. "Arrow-plane," and with h.l. back-swept mono., L. Shone with h.l. 1-1-0-P2, capable of some very neat glides when screws stop. F. Lowe flying Tear's veteran looper and skyscraper, which performs as good as ever. Nov. 14th, G. H. Kilshaw testing new canard biplane, both r.o.g. and h.l., 21st, B. Tear appeared with a promising r.o.g. biplane canard, which, during one flight of 25 secs., reached fully 60 ft. high. F. Lowe with r.o.g. propellers behind tail mono., doing good durations and fair altitudes. G. H. Kilshaw with r.o.g. biplane canard, but appears rather sluggish. Also prospective member present with a neat r.o.g. Deperdussin tractor. 28th, Trophy trials (r.o.g. biplanes), B. Tear, T. W. Bennett, and G. H. Kilshaw testing their machines, the former having a bad *fuselage* smash, his machine having shown good promise. Bennett also flew r.o.g. arrow-plane, and F. Lowe an exceedingly fine racer. The club's latest member to join the Colours is Mr. J. F. Connolly; A. G. Pugh and M. Payne having enlisted previously. Intending members are

asked to notify the hon. secretary at once. Subscriptions 5s. per year, payable quarterly.

Scottish A.e.S. Model A.C. (5, DOUNE QUADRANT, GLASGOW).

DEC. 5TH AND 19TH, Paisley Racecourse, all types for attempts on records. Trains, 2.25 and 3 p.m. Central.

Monthly Report.—At Paisley, on 31st Oct., Mr. G. Pinney testing a single-screw tractor in very stormy weather. Nov. 14th, at Paisley, the single-screw tractor h.l. competition was carried through. Mr. Ian S. Ross, with 24 points, won the pair of carved propellers presented by the secretary. Mr. G. Pinney was the runner-up with 19½ points. Mr. Ross's distance attempts were 288 ft., 206 ft. and 191 ft., and the duration 16 secs., 12 secs. and 12 secs. Mr. Pinney's attempts were 190 ft., 179 ft. and 223 ft., and 8 secs., 8 secs. and 15 secs. The formula of 20 ft. = 1 pt., 1 sec. = 1 pt. (the idea of Mr. Mennell, of Stony Stratford and District K. and M.A.C.), worked splendidly. The official Scottish distance record of 273 ft., published in last month's report, is for tractors. On Nov. 14th, at Paisley, Mr. Ian S. Ross made two new official Scottish records, one for single-screw tractors, h.l., of 288 ft. distance, and one for single-screw tractors, r.o.g., of 15 secs. duration. The club has been fortunate in securing Mr. John R. K. Law (brother of Mr. Bonar Law, M.P.) as its president. The club badges are now ready, price 3s. each.

S. Eastern Model A.C. (154, PECKHAM RYE, S.E.).

Monthly Report.—A meeting was held during the month by the committee of the above club. It has been agreed by them that all meetings of this club should be suspended for the duration of the war, but individual flying will take place as usual. This course has been adopted by the club owing to the fact that the majority of the members have answered their country's call. Several members have joined the Royal Naval Air Service, in which they will see active service very shortly. Other members have enlisted into various regiments, including the Wiltshires, Middlesex, &c., and should by now be coming quite acquainted to military life.

Southend, Westcliff and Leigh Model Aero Club (96, VALKYRIE ROAD, WESTCLIFF-ON-SEA).

FLYING is now carried out Saturdays, morning and afternoon. Prospective members should communicate with hon. sec. at above address.

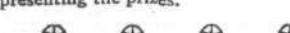
Monthly Report.—The flying during the past month has been generally on an exceptionally good scale, many new buses making their appearance. A very good flight was put up by E. Woodfield, 30 secs., single screw, 2-ft. model, E. Frockter flying large single screw, twin gear; also large monoque tractor weighing 10 ozs., with excellent results.

Twickenham and District (74, CLIFDEN ROAD, TWICKENHAM).

DEC. 5TH, weight-lifting competition at the aerodrome, 5th Cross Road, for Mr. Ferry's prizes.

Monthly Report.—The above club has had a very successful month again, single-propeller machines being very much in evidence. Several members are now making power-driven machines of the compressed-air type, also there is a flash steam plant under consideration. Mr. Clayton has had out two machines, both single-propellers, about 4½ ozs. each, duration about 45 secs. Mr. Ord has had out 6 oz. tractor, Handley-Page wings, and an 8-oz. r.o.g. single-propeller machines. Mr. Franklyn has been flying several machines of the (1-1-0-P2) type, and two single screw-machines, a tractor and pusher-type respectively, the latter breaking the club duration record. Mr. Maynard has had out a machine also of the (1-1-0-P2) type, with Normale-type propellers, which are not very suitable for the machine; his duration will be very much improved when his machine is provided with suitable propellers. Mr. Ferry has had out three twin-screw pusher-type, with good duration; the workmanship of these models is excellent, in fact the best the club has seen for some time. Brown, Joyce, and Barnes out with various types, putting up durations of fair length; while Mr. Whyte brought out the antipodes of the weight-lifters, now on their trials, a 9-inch twin-screw little bus, which does good banked circles. As regards the weight-lifters, Messrs. Ord and Clayton have co-operated in the building, as also have Messrs. Franklyn and Rice-Skinner. These machines are approximately 5 ft. 6 ins. wide, with a length of 5 ft., built-up bodies, the total weight being 17 ozs. without weight and a loading of 4. Mr. Rice-Skinner has had out a r.o.g. machine (0-1-1-P2) type and several single-propeller machines, all about 6 ozs. in weight. This month an efficiency competition was held, using

Weight of machine
Weight of rubber \times duration + marks for construction. Mr. Clayton eventually won this, with Mr. Ferry second and third. Next week, as announced above, there will be a weight-lifting competition, minimum weight 12 ozs., carrying $\frac{1}{2}$ of total weight, and minimum duration of 20 secs. Mr. Maughan-Ferry is presenting the prizes.



Aeronautical Patents Published.

Applied for in 1913.

Published November 26th, 1914.

25,559. O. HAWKINS. Flying machine.

Applied for in 1914.

Published November 26th, 1914.

7,576. J. D. COOPER. Floats for hydro-aeroplanes.

9,848. L. V. KUNKLER. Projectiles for use with aircraft.

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